



AF 3611

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND  
INTERFERENCES**

Application Number : 09/877,188  
Applicant : FECTEAU et al.  
Filed : June 11, 2001  
Tech Center/AU : 3611  
Examiner : Luby, Matthew D.  
Entitled : SNOWMOBILE RIDER POSITIONING  
  
Attorney Reference : 086169-257000  
Customer Number : 00909

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**GROUP 3600**

**TRANSMITTAL LETTER**

Enclosed herewith are the following documents:

- Fees Transmittal
- Supplemental Brief

Applicants hereby request a three month extension of time under 37 C.F.R. 1.136(a).

Respectfully submitted,  
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☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ 1,280.00

## Complete if Known

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1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
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### 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

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Multiple Dependent:  =

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1202	18	2202	9	Claims in excess of 20	
1201	86	2201	43	Independent claims in excess of 3	
1203	290	2203	145	Multiple dependent claim, if not paid	
1204	86	2204	43	** Reissue independent claims over original patent	
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### 3. ADDITIONAL FEES

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1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for <i>ex parte</i> reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	950.00
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing brief in support of an appeal	330.00
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
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1806	180	1806	180	Submission of Information Disclosure Stmt	
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1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
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Other fee (specify) \_\_\_\_\_

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND  
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In re PATENT APPLICATION OF:

PECTEAU et al.

Group Art Unit: 3611

Application No.: 09/877,188

Examiner: Luby, Matthew D.

Filed: June 11, 2001

Title: SNOWMOBILE RIDER POSITIONING

**SUPPLEMENTAL BRIEF ON APPEAL**

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I. INTRODUCTION

This Supplemental Appeal Brief is filed further to Appellants' Notice of Appeal filed May 1, 2003 and reinstates the Appeal in accordance with 37 C.F.R. § 1.193(b)(2)(ii). This Supplemental Appeal Brief addresses the Office Action dated December 9, 2003, rejecting claims 1-130 of the above-identified patent application, and the subject matter discussed during the personal interview conducted on January 15, 2004.

A. Real Party in Interest

The real party in interest for this Appeal and the present application is Bombardier Recreational Products Inc., by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 014294, Frame 0426 on January 29, 2004.

B. Statement of Related Appeals and Interferences

This application is a continuation-in-part application of U.S. Application 09/472,134, filed December 23, 1999, which is presently under appeal by way of a Brief on Appeal filed on May 27, 2003, and which was docketed as Appeal No. 2004-0921 by way of a Docketing Notice mailed March 5, 2004. The related appeal is directed to different aspects of this inventive concept, and appeals rejections based on different issues. Therefore, the outcome of the appeal in U.S. Application 09/472,134 should not directly affect, be directly affected by, or have a bearing on the Board's decision in this appeal.

Moreover, the arguments presented herein are specifically directed to the claims presently on appeal. The arguments, therefore, should not be construed to have any affect on the patentability of claims in a co-pending related application. In addition, to the extent that arguments presented herein are construed to establish prosecution history estoppel, those arguments should not be construed to limit in any way claims presented in any other co-pending, related applications.

C. Status of Claims

Claims 1-130 are pending.

Appellants appreciate the courtesies extended to Appellants' representatives by Supervisory Patent Examiner Morris, Examiner Luby and Primary Examiner Boehler at the interview conducted January 15, 2004. During the interview, it was agreed that claim 33 defines patentable subject matter over the art forming the basis for the rejection set forth in the December 9, 2003 Office Action. (See the Interview Summary, Paper No. 21.) It is respectfully submitted that claims 34-36, which depend from claim 33, also patentably distinguish the claimed invention over the prior art relied upon to craft the rejection. It is also respectfully submitted that claims 88-91, 96-99, 105-108 and 119-121, which recite features similar to claims 33-36 and depend from claims 84, 92, 104 and 118, respectively, also patentably distinguish the claimed invention over the prior art asserted to support the rejections in the December 9, 2003 Office Action.

As presented in this application, each of independent claims 1, 84, 92, 104 and 118 recites, *inter alia*, that the steering position is disposed forward of the forward-most drive track axle. Although no agreement was reached regarding this feature patentably distinguishing over the applied prior art, Appellants' Admitted Prior Art (AAPA) in view of Christensen et al. (U.S. Patent 3,734,219), it was agreed that neither AAPA nor Christensen et al. disclose or suggest this feature, *inter alia*, in combination with the distances recited in claim 33. As discussed above, claims 34-36 recite additional distances regarding the steering position being disposed forward of the forward-most drive track axle and it is respectfully submitted that claims 34-36 are allowable. As also discussed above, each of independent claims 84, 92, 104 and 118 recites that the steering position is disposed forward of the forward-most drive track axle and it is respectfully submitted that claims 88-91, 96-99, 104-108 and 119-121, which recite distances similar to claims 33-36, are allowable.

It is respectfully submitted that claims 1-32, 37-87, 92-95, 100-104, 109-118 and 122-130 stand rejected and are on appeal. The claims on appeal are set forth in the attached Appendix A. Claims 1, 26, 52, 67, 77, 84, 92, 100, 104 and 118 are independent. Claims 2-25 and 109 depend from claim 1; claims 27-32, 37-51 and 110 depend from claim 26; claims 53-66 and 111 depend from claim 52; claims 68-76 and 112 depend from claim 67; claims 78-83 and 113 depend from claim 77; claims 85, 86 and 114 depend from claim 84; claims 93-95 and 115 depend from claim 92; claims 101-103 and 116 depend from 100; claim 117 depends from claim 104; and claim 122-130 depend from claim 118.

In the event that the Examiner's Answer maintains and repeats the rejections of claims 34-36, 88-91, 96-99, 105-108 and 119-121 from the December 9, 2003 Office Action, Appellants will file a separate Reply Brief to address those claims.

D. Status of Amendments and Summary of Prosecution History

An Amendment under 37 C.F.R. §1.111 was filed February 10, 2003 in response to a first Office Action dated October 8, 2002. A second, final Office Action was issued on April 7, 2003. The final Office Action indicated that claims 1-117, including amended claim 52 and new claims 109-117 set forth in the February 10, 2003 Amendment, were rejected.

A Notice of Appeal was filed May 1, 2003 and an Appeal Brief was filed May 28, 2003. The contents of the May 28, 2003 Appeal Brief are incorporated in their entirety into this Supplemental Appeal Brief.

In response to the May 28, 2003 Appeal Brief, Examiner Luby reopened prosecution and entered a new grounds of rejection in an August 29, 2003 Office Action. The August 29, 2003 Office Action was the third Office Action issued in the instant application.

A personal interview was conducted on September 10, 2003. Attendant at the interview were the undersigned, Jeffrey Karceski and Caroline Dennison of Pillsbury Winthrop LLP, Jonathan Cutler of Bombardier Recreational Products Inc. (the assignee of the

instant application), Bruno Girouard (the first named inventor), Examiner Luby, Examiner Boehler (the examiner of the parent application) (who was present at the exhibition of a snowmobile constructed according to the present invention and a snowmobile constructed according to the prior art shown in Figure 1), Quality Assurance Specialist (QAS) Melius and Supervisory Patent Examiner (SPE) Dickson of Art Unit 3618.

During the September 10, 2003 interview, a snowmobile constructed according to the invention and a snowmobile constructed according to the prior art shown in Figure 1 of the instant application were demonstrated. Examiners Luby and Boehler, QAS Melius and SPE Dickson were permitted and encouraged to ask questions about the snowmobiles. All of the questions presented were answered by the undersigned, Ms. Dennison, Mr. Karceski, Mr. Cutler, and Mr. Girouard. Mr. Girouard demonstrated the differences between the claimed invention and the prior art snowmobile of Figure 1. Examiner Luby, QAS Melius and SPE Dickson were permitted and encouraged to sit on the snowmobile constructed according to the invention and the snowmobile constructed according to the prior art shown in Figure 1. The recollection of the undersigned is that each did so.

After the demonstration of the snowmobiles, the pending claims were discussed in view of the applied prior art. Examiner Boehler did not attend the discussion of the pending claims and prior art.

During the discussion, among other things, it was agreed that Applicants' Admitted Prior Art (AAPA) did not disclose or suggest a steering position disposed forward of a forward-most drive track axle, as recited in independent claims 26, 84, 92 and 104. (See the September 10, 2003 Interview Summary, Paper No. 16.)<sup>1</sup> The Interview Summary also

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<sup>1</sup> With respect to this limitation, the Appellants respectfully submit that this is but one feature of the invention. The invention, however, is not limited solely to a construction where the steering portion is disposed forward of a forward-most drive track axle. The Appellants respectfully submit, therefore, that this limitation does not limit, through application of prosecution history estoppel, any claims that do not recite this feature as presented in these claims. Moreover, the feature should not be read into any other claims, in this application or any other related, co-pending application unless specifically recited thereby.



indicates that all claims would be subject to further search and/or consideration to ensure that no other references would meet the claims. In addition, as indicated in the Interview Summary, nine references were provided by SPE Dickson to the undersigned and Ms. Dennison. These references were to be cited on a PTO-892.

The nine references provided to the undersigned were: U.S. Patent 6,260,648 to Bessette; U.S. Patent 4,633,964 to Boyer et al.; U.S. Patent 4,502,560 to Hisatomi; U.S. Patent 4,301,884 to Taylor; U.S. Patent 3,828,872 to Tsuchiya et al; U.S. Patent 3,734,219 to Christensen et al.; U.S. Patent 3,578,095 to Hauser; U.S. Patent 3,517,457 to Peno; and U.S. Patent 3,213,955 to Hetteen.

Of the nine references provided, three were already of record in the instant application: U.S. Patent 4,633,964 to Boyer et al.; U.S. Patent 4,502,560 to Hisatomi; and U.S. Patent 3,734,219 to Christensen et al. The remaining six were not of record.

After careful consideration of all prior art of record, and prior art not yet of record, an Amendment was filed September 16, 2003. Each of independent claims was amended to recite a snowmobile including a steering position forward of a forward-most drive track axle in combination with various other novel and non-obvious aspects of the claimed invention.

Examiner Luby issued a fourth Office Action dated December 9, 2003. In the Office Action, every single independent claim was rejected under 35 U.S.C. § 103(a) over AAPA in view of U.S. Patent 3,734,219 to Christensen et al. Despite the fact that Appellants submitted the Christensen et al. reference ten months earlier, on February 20, 2003, and despite the fact that the Christensen et al. reference was of record in the parent application and supposedly already considered by Examiner Luby (see MPEP § 609I.A.2.), a PTO-892 listing the Christensen et al. reference was issued with the December 9, 2003 Office Action. However, none of the other references provided by SPE Dickson during the September 10, 2003 interview, including the six not yet of record, were cited on the PTO-892.

In an attempt to advance the prosecution of the application and address the new rejections based on AAPA and Christensen et al., the undersigned and Jeffrey Karceski conducted the January 15, 2004 interview with SPE Morris, Examiner Luby and Primary Examiner Boehler. As discussed above, it was agreed that claim 33 patentably defined over the combination of AAPA and Christensen et al. During the interview, Examiner Boehler indicated that she believed that Christensen et al. may anticipate some of the claims. Although SPE Morris indicated that prosecution of the application would not be reopened in response to the filing of this Supplemental Appeal Brief for entry of a rejection under 35 U.S.C. § 102(b) over Christensen et al., in order to fully address the applied prior art this Supplemental Appeal Brief will clearly discuss the features of each independent claim which are not disclosed or suggested by Christensen et al.

In view of the prosecution history of the instant application, Appellants feel compelled to reinstate the Appeal and request this Honorable Board to reverse the rejections based on the following arguments.

## II. SUMMARY OF THE INVENTION

A summary of the invention was provided in the Appeal Brief filed May 28, 2003, incorporated herein by reference. For convenience in deciding the instant appeal, the summary is repeated below.

### A. Background

The parent application, 09/472,134, was originally filed including claims directed to a snowmobile. Original claims 1-83 included recitations, for example, of the distance between a vertical line through a first center of gravity of the snowmobile without a rider and a vertical line passing through a second center of gravity of the snowmobile with the rider, and recitations, for example, of the angle of a line passing through the first and second centers of gravity with respect to horizontal.

Various claims of the parent application were rejected under 35 U.S.C. § 101 on the grounds that “Applicant improperly defines his invention with respect to a rider’s body.” The claims of the parent application that were rejected under 35 U.S.C. § 101 were also rejected under 35 U.S.C. § 112, second paragraph as indefinite on the grounds that “the relationship of parts is not based on any known standard for sizing the vehicle to a rider.”

In response to Appellants’ arguments that the claims defined statutorily patentable subject matter and particularly pointed out and distinctly claimed the subject matter that Appellants regarded as their invention, Examiner Boehler stated in a September 12, 2000 Office Action (Appendix B) “Applicant has clearly avoided claiming dimensions of the snowmobile with respect to a known standard. The examiner sees no reason why, if applicant meant to claim particular dimensions of the vehicle, he did not do so.” (See page 7, paragraph number 15 of Appendix B.)

Taking the Examiner Boehler’s cue, the instant application was prepared and filed, in part, in response to the Examiner Boehler’s suggestion. Specifically, the instant application discloses and claims the inventors’ snowmobile in terms of the dimensions of the snowmobile.

#### B. Related Art Problems Overcome by the Invention

Conventional snowmobiles share a common construction that combines features and elements so that a rider sits in a generally upright position in a location toward the rear of the snowmobile. The rider sits a considerable distance behind the center of gravity of the snowmobile, located at or proximate to the axis of the forward-most of the drive track. (Page 1, paragraph [0003].)

The positions of the handle bars, seat and foot rests of a conventional snowmobile relative to the center of gravity of the snowmobile place the driver far behind the center of

gravity and cause the driver to more strongly feel each bump as the snowmobile travels over the ground. As the snowmobile encounters a bump, the snowmobile pivots about the center of gravity and acts as a lever that amplifies the magnitude of the force that is transferred from bumps on the ground to the rider. (Page 1, paragraphs [0004] and [0005].)

A passenger on the snowmobile is positioned even further away from the center of gravity and feels each bump even more strongly than the driver of the snowmobile. A third seat has not been added to conventional snowmobiles because the second passenger (third rider) would be positioned even further from the center of gravity and experience prohibitively larger forces. (Pages 1 and 2, paragraphs [0005] and [0006].)

Although the positioning of the driver and passenger on the conventional snowmobile is adequate for enjoying the sport, a need has arisen for a snowmobile where the driver's and passenger's positions are improved to minimize the affect on the riders due to the snowmobile's movement over uneven terrain. In addition, a design has developed for a snowmobile that may comfortably accommodate two passengers in addition to the driver. (Page 2, paragraphs [0007] and [0008].)

C. Object of the Invention

It is an object of the invention to improve upon the conventional design by repositioning the riders on a snowmobile and redesigning the layout of the snowmobile to minimize the effect of the snowmobile's movement on the driver and passengers as they pass over uneven terrain. It is also an object of the invention to facilitate the addition of a third seat for a third rider, who may experience a reasonably comfortable ride. (Page 2, paragraph [0009].)

D. Embodiments of the Invention

Referring to Figure 8, various dimensions of the six embodiments of the present invention are compared to dimensions of conventional snowmobiles on Page 10. Reference characters A-N and  $\epsilon$  represent variables that are commonly defined below. The positive direction is defined backward relative to the direction of travel of the snowmobile and horizontal distances are measured when the unloaded snowmobile is positioned on level ground. (Page 6, paragraph [0034].) In other words, positive distances are measured from front to back of the snowmobile. Horizontal distances A-N are measured in millimeters and are understood to be preferably within 25 mm of the stated dimension shown in Figure 8, more preferably within 15 mm of the dimension and even more preferably within 5 mm of the dimension. The horizontal distances are summarized as follows:

A – axis of the forward-most drive axle to the center of gravity of the unloaded snowmobile;

B – steering position to the center of gravity of the unloaded snowmobile;

C – center of gravity of the unloaded snowmobile to the center of gravity of the first rider (driver);

D – center of gravity of the unloaded snowmobile to a seat position of the first rider (driver);

E – center of gravity of the first rider to a center of gravity of the second rider;

F – seat position of the first rider (driver) to a seat position of the second rider (first passenger);

G – center of gravity of the second rider to the center gravity of the third rider (second passenger);

H – second seat position to a third seat position;

I – center of gravity of the unloaded snowmobile to a combined center of gravity of the snowmobile and first rider;

J – center of gravity of the unloaded snowmobile to a combined center of gravity of the snowmobile, first rider and second rider;

K – center of gravity of the unloaded snowmobile to the combined center of gravity of the snowmobile and first through third riders;

L – steering position to a rearward most seat position;

M – back end of the frame of the snowmobile to the back end of the second seat section; and

N – back of the frame of the snowmobile to a rear most seat position. (Page 6, paragraph [0035].)

Angle  $\varepsilon$  is measured between vertical and an angular position of a steering shaft of the snowmobile. (Page 6, paragraph [0035].)

Snowmobiles may be manufactured with either a short frame or a long frame. A short frame preferably has a length of about 1493 mm. The short frame provides the driver with the feeling that the snowmobile is lighter and more maneuverable than a snowmobile with a long frame. The short frame also reduces the polar moment of inertia of the snowmobile

about the vertical axis. The long frame is about 1913 mm long, provides two or more permanent seats and a larger cargo space.

1. Embodiment 1 of the Invention

Referring to Figure 2, the snowmobile 10 has a forward end 11 and a rearward end 13 that are defined consistently with the travel direction of the snowmobile 10. The snowmobile 10 includes a body 12, a frame 14, and a motor (e.g., an internal combustion engine) 17 carried by the frame at the forward end 11. Two skis 16 are attached to the forward end 11 of the frame 14 through a suspension system 18. A drive track 20 is disposed under the frame 14 and is connected operatively to the motor 17. (Page 7, paragraph [0037].)

A straddle type seat 50 is disposed on the frame 14 behind the motor 17 and has a first seat position 52, which is defined as a portion of the seat 50 that is adapted to support a center of a weight distribution of the first rider 26 on the seat. As would be appreciated by those skilled in the art, the term “seat position” defines particular positions on the snowmobile 10 that are adapted to function as the seat position for a standard rider, the dimensions of which are shown in Figures 9 and 10. Riders 26, 28 and 30 are standard riders. (Page 8, paragraphs [0039] and [0040].)

A steering device 32 is positioned at the forward end of the snowmobile 10 above the motor 17 and has a steering position defined by a center of a portion of the steering device adapted to be held by the hands of the rider 26. The steering device 32 may be a handlebar, a steering wheel or yoke of the type used in aircraft or a handlebar. (Page 8, paragraphs [0041] and [0042].)

A steering shaft 36 operatively connects the steering device 32 to the two skis 16 and is disposed over the motor 17 at an angle  $\epsilon$  from vertical. The position of the axis of the

steering shaft 36 is more steeply sloped than steering shaft 136 in prior art snowmobile 110 (Figure 1) having a steering shaft over the engine. The angle  $\epsilon$  is less than  $45^\circ$ , more preferably between  $25$  and  $40^\circ$ , more preferably between about  $30$  and  $35^\circ$  and most preferably about  $33^\circ$ . (Page 9, paragraph [0044].)

The provision of the angle  $\epsilon$  less than  $45^\circ$  facilitates placement of the steering position 34 in a position on the snowmobile 10 that is forward of the steering position 134 for the conventional snowmobile 110, shown in Figure 1. The forward position of the steering position 34 moves the riders 26 and 28 closer to the center of gravity 46 of the snowmobile 10 and improves the comfort of riders 26 and 28. Additionally, the turning force applied by the first rider (driver) 26 is more directly applied to steer the snowmobile 10 when the angle  $\epsilon$  is less than  $45^\circ$ . (Page 9, paragraph [0045].)

Because the steering device 32 is shifted forward, the steering position 34 is disposed in front of the center of gravity 46 of the snowmobile 10 by distance B, in contrast to the steering position 134 of the conventional snowmobile 110 which is behind the center of gravity 146 of the prior art snowmobile 110, shown in Figure 1. (Page 9, paragraph [0046].)

The first seat position 52 is located behind the forward-most drive axle 44 by a horizontal distance calculated as distance D plus distance A. In the snowmobile 10 of the first embodiment, this distance is less than 590 mm, in contrast to the first seat position 152 of the conventional snowmobile 110, shown in Figure 1, which is a much larger 905 mm behind forward-most drive axle 144. (Page 10, paragraph [0050].)

The second seat position 54 is disposed on the seat 50 behind the first seat position 52 and is adapted to accommodate a second rider (first passenger) 28. The second seat position 54 is disposed the distance F behind the first seat position 52. As the first seat position 52 of



the inventive snowmobile 10 is moved forward compared to the first seat position 152 of the conventional snowmobile 110, the second seat position 54 of the inventive snowmobile 10 is in a position similar to the driver of the conventional snowmobile 110, thus improving the ride for the second rider (first passenger) 28 of the inventive snowmobile 10. (Pages 10 and 11, paragraph [0051].)

As illustrated in Figure 8, the center of gravity 27 of the first rider 26 is closer to the center of gravity 46 of the inventive snowmobile 10, as shown by the distance C, than the center of gravity 127 of the first rider 26 would be on the conventional snowmobile 110. (Page 11, paragraph [0054].)

The center of gravity 29 of the second rider (first passenger) 28 is also disposed behind the center of gravity 46 of the inventive snowmobile 10 by the distance C plus the distance E, which is less than distance that the center gravity 129 of a second rider 128 would be behind the center of gravity 146 of the conventional snowmobile 110. (Page 12, paragraph [0055].)

## 2. Embodiment 2 of the Invention

Referring to Figure 3, the inventive snowmobile 210 of the second embodiment has a shorter frame and a shorter drive track 220 than the frame 14 and the track 20 of the first embodiment of the inventive snowmobile 10. The short frame 214 and drive track 220 reduce the rotational inertia of the inventive snowmobile 210 of the second embodiment and improve its handling performance. The distances A-F, I, J, and K-N of the second embodiment are correspondingly altered from the first embodiment, as shown in Figure 8. (Page 12, paragraphs [0056] and [0057].)

Because the steering device 32 is shifted forward relative to the conventional snowmobile 110, the forward-most drive axle 244 of the inventive snowmobile 210 is disposed behind the steering position 34 by a distance calculated as distance B minus distance A. According to the second embodiment of the invention, in fact as with all of the embodiments of the present invention, this distance is positive. In contrast, the steering position 134 on conventional snowmobile 110 is positioned behind the forward-most drive axle 144 of the conventional snowmobile 110 (i.e., the distance is negative), as shown in Figures 1 and 8. (Page 13, paragraph [0059].)

### 3. Embodiment 3 of the Invention

Referring to Figures 4A and 4B, the snowmobile 310 of the third embodiment has a short frame 314 and drive track 320, like the snowmobile 210 of the second embodiment. As in all embodiments of the present invention, the axle of the steering shaft 36 forms an angle  $\epsilon$  with vertical that is less than  $45^\circ$  which moves the positions of the riders 26 and 28 closer to the center of gravity 346 of the snowmobile 310. As in all of the embodiments of the present invention, the forward-most drive axle 344 of the snowmobile 310 is disposed behind the steering position 34 by the distance calculated as distance B minus distance A, which is a positive distance. (Page 14, paragraphs [0066], [0067] and [0068].)

The seat 350 includes a first seat section 350' and a second seat section 350'' as shown in Figure 4B. In the third embodiment, the second seat section 350'' is removable and cargo space 394 is provided behind the first seat section 350' beneath the second removable seat 350''. A cover 395 can be attached over the cargo space 394 when the second seat section 350'' is not attached. (Page 15, paragraph [0069].) A support element 360 extends upwardly and rearwardly from the frame 314 and fasteners secure the second seat section

350'' to the frame 314 via the support element 360, as shown in Figure 4B. (Page 16, paragraph [0072].)

A tunnel 314' forms the back end 314'' of the frame 314. A snow flap 380 extends rearwardly behind the back end 314''. The support element 360 extends rearwardly behind the back end 314'' of the frame 314 to structurally support the second seat section 350'' behind the back end 314''. The second seat position 354 is disposed second seat section 350'' a distance N behind the back end 314''. In the third embodiment, the distance N is positive in contrast to the second seat position 154 of the conventional snowmobile 110 which does not extend behind the back end of the frame because the second rider (first passenger) 28 would be prohibitively far away from the center of gravity 146 of the conventional snowmobile 110. (Pages 15 and 16, paragraphs [0073] and [0074].)

#### 4. Embodiment 4 of the Invention

Referring to Figure 5, the snowmobile 410 of the fourth embodiment has a long frame 414 and drive track like the snowmobile 10 of the first embodiment. (Page 17, paragraph [0079].) The axis of the steering shaft 36 forms an angle  $\epsilon$  with vertical that is less than  $45^\circ$ , which permits placement of the steering position 34 forward of the forward-most drive axle 444 by the distance calculated as distance B minus distance A. In contrast, the steering position on the conventional snowmobile 110 is positioned behind the forward-most drive axle 144. (Page 17, paragraphs [0080] and [0081].)

The seat 450 includes an integral seat defining a first seat position 452, a second seat position 454, and a third seat position 456. (Pages 17 and 18, paragraphs [0082], [0083] and [0084]). The third rider (second passenger) 30 of the inventive snowmobile 410 is closer to the center of gravity 446 of the snowmobile 410 and experiences less forces than the second

rider (first passenger) 28 would experience on the conventional snowmobile 110. (Page 18, paragraph [0084].)

## 5. Embodiment 5 of the Invention

Referring to Figures 6A and 6B, the snowmobile 510 has long frame 514 and drive track 520 like the snowmobile 10 of the first embodiment. As in all of the embodiments of the present invention, the axis of the steering shaft 36 forms an angle  $\varepsilon$  with vertical that is less than  $45^\circ$  and the steering position 34 is disposed ahead of the forward-most drive axle 554 by a distance calculated as distance B minus distance A. (Page 19, paragraph [0091].)

The seat 550 is formed by a first seat section 550' and second a seat section 550'' that is removable. A cover, shown in Figures 11A-D, may be used to cover a cargo space 594 located beneath the second seat section 550'' and behind the first seat section 550'. (Page 20, paragraph [0092].)

A tunnel 514' forms the back end 514'' of the frame 514 and a snow flap 580 extends rearwardly behind the back end 514''. A support element 560 extends upwardly and rearwardly from back end 514'' to provide support for the second seat section 550''. The third seat position 556 and back end of the second seat section 550'' extend behind the back end 514'' of the frame 514 by positive distances N and M respectively. (Pages 20 and 21, paragraphs [0096] and [0097].)

## 6. Embodiment 6 of the Invention

Referring to Figure 7, the snowmobile 610 of the sixth embodiment may have a short or long frame 614. As in all of the embodiments of the present invention, the axis of the steering shaft 36 forms an angle  $\varepsilon$  with vertical that less than  $45^\circ$  and the steering position 43

is disposed ahead of the forward-most drive axle 644 by a distance calculated as distance B minus distance A, in contrast to the steering position 34 of the conventional snowmobile 110 which is positioned behind the forward-most drive axle 144. (Pages 22 and 23, paragraphs [0105]-[0107].)

The snowmobile 610 has a seat 650 configured to a single rider 26 that defines a seat position 652. The seat position 652 is behind the forward-most drive axle 644 by a horizontal distance calculated as distance D plus distance A which is preferably between 540 mm and 590 mm. In contrast, the first seat position 152 of the conventional snowmobile 110 is a much larger 905 mm behind the forward-most drive axle 144, as shown in Figure 1. (Page 23, paragraph [0108].)

### III. ISSUES AND REJECTIONS

The December 9, 2003 Office Action rejects claims 1-21, 24, 26-47, 50, 52-65, 67-75 and 77-130 under 35 U.S.C. § 103(a) over Applicants' Admitted Prior Art (AAPA) in view of Christensen et al. (U.S. Patent 3,734,219) and rejects claim 22, 23, 25, 48, 49, 51, 66 and 76 under 35 U.S.C. § 103(a) over AAPA in view of Christensen et al. and further in view of Atherley (U.S. Patent 5,944,380).

As discussed above, Appellants respectfully submit, that based on the agreement reached during the January 15, 2004 interview, that claims 33-36, 88-91, 96-99, 105-108 and 119-121 patentably define over the combination of AAPA and Christensen et al. In the event that the Examiner's Answer rejects those claims, Appellants will address them in a Supplemental Reply Brief.

Thus, the issues on appeal are whether: 1) claims 1-21, 24, 26-32, 37-47, 50, 52-65, 67-75, 77-87, 92-95, 100-104, 109-118 and 122-130 are obvious over AAPA in view of

Christensen et al. and 2) claims 22, 23, 25, 48, 51, 66 and 76 are obvious over AAPA in view of Christensen et al. and Atherley '380.

#### IV. GROUPING OF CLAIMS

Each claim of this patent application is separately patentable and upon issuance of a patent will be entitled to a separate presumption of validity under 35 U.S.C. §282. As there are two grounds of rejection, each of which applies to a group of two or more claims, there are two groups for purposes of this appeal. See 37 C.F.R. § 1.192(c)(7). For convenience in handling of this Appeal, the claims are grouped as follows:

Group I, claims 1-21, 24, 26-32, 37-47, 50, 52-65, 67-75, 77-87, 92-95, 100-104, 109-118 and 122-130; and

Group II, claims 22, 23, 25, 48, 51, 66 and 76.

The claims of each group do not stand or fall together and arguments as to the separate patentability of each claim are presented below.

Although the December 9, 2003 Office Action rejects claims 1-21, 24, 26-47, 50, 52-65, 67-75 and 77-130 over AAPA in view of Christensen et al, the Office Action groups and addresses these claims in various numbered paragraphs throughout the Office Action. For convenience in deciding this appeal, the following arguments will address the claims in the order they are addressed by the December 9, 2003 Office Action.

## V. ARGUMENT

### A. The Law

#### 1. The Law Regarding Factual Inquires to Determine Obviousness/Non-Obviousness

Several basis factual inquiries must be made to determine obviousness or non-obviousness of patent application claims under 35 U.S.C. § 103. These factual inquiries are set forth in Graham v. John Deere Co., 383 US 1, 17, 148 USPQ 459, 467 (1966);

Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined.

As stated by the Federal Court in In re Ochiai, 37 USPQ 2d 1127, 1131 (Fed. Cir. 1995);

[T]he test of obviousness *vel non* is statutory. It requires that one compare the claim's subject matter as a whole with the prior art to which the subject matter pertains. 35 U.S.C. § 103. The inquiry is thus highly fact-specific by design . . . When the references cited by the Examiner fail to establish a *prima facie* case of obviousness, the rejection is improper and will be overturned. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988) (Emphasis added).

In rejecting claims under 35 U.S.C. § 103(a), an Examiner bears an initial burden of presenting a *prima facie* case of obviousness. A *prima facie* case of obviousness is established only if there is a suggestion or motivation to combine reference teachings; a reasonable expectation of success; and the prior art references, when combined, teach or suggest all the claim limitations. If an Examiner fails to establish a *prima facie* case, a rejection is improper and will be overturned. See In re Rijckaert, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). "If examination . . . does not produce a *prima facie* case of

unpatentability, then without more, the Applicant is entitled to the grant of the patent.” In re Oetiker, 977 F.2d 1443, 1445-1446, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

B. Rejections Under 35 U.S.C. § 103(a)

1. Applicants’ Admitted Prior Art (AAPA)

The conventional snowmobile 110 (Figure 1) is constructed so as to position a rider (driver) 26 in a generally upright seated position in a location toward the rear of the snowmobile 110. When seated in this fashion, the rider 26 sits a considerable distance behind the center of gravity 146 of the snowmobile 110, which is located at or in proximity to the axis of the forward-most axle 144 of a drive track 120.

The snowmobile 110 includes a steering device 132 that defines a steering position 134 that is positioned behind both the forward-most axle 144 and the center of gravity 146 of the snowmobile 110. A second seat position 154 for a second rider (first passenger) 28 is positioned even further behind the forward-most axle 144 and the center of gravity 146 of the snowmobile.

The conventional snowmobile also includes a steering shaft 136 that operatively connects the steering device 132 to the front skis 116. As shown in Figure 8, the steering shaft 136 is disposed at an angle  $\epsilon$  to vertical that is greater than or equal to 45°.

2. Christensen et al.

Christensen et al. disclose a steering system for a snowmobile *a*. The snowmobile *a* includes a rigid structure *b* and an internal combustion engine (not shown). A driver’s seat *d* is mounted on a longitudinally central mechanism enclosure *e*. The rear portion of the snowmobile *a* is supported on a driving belt *f*. The belt *f* runs around a conventional engine-



driven sprocket *h* and a sprocket *j*, mounted respectively on forward and rearward shafts *k*, *m* that are rigidly secured to and tiltable with the structure *b*. (Col. 2, lines 12-27.)

A steering handle 10 is connected by a conventional linkage (not shown) to left and right steering shafts 11, 12. The two steering shafts 11, 12 are mounted in elongated bushings 13, 14 that are secured to the structure *b* as to slope forward and downward, preferably in substantially parallel planes spaced symmetrically from the centerline of the snowmobile *a*. The bushings 13, 14 are preferably affixed to the structure *b* somewhat farther outboard than is conventional. The bushings 13, 14 position the axis *p* of each steering shaft 11, 12 forward and downward as measured from vertical lines *q* passing through the respective shaft lower ends 15, 16. The axes *p* of the two steering shafts 11, 12 are at an angle *t* to the vertical lines *q* that is approximately 25° more or less. The two shaft lower ends 15, 16 are positioned well forward of the snowmobile's center of gravity *c.g.* The two shaft lower ends 15, 16 mount a pair of conventional left and right skis 19, 20 on substantially lateral pivot axes. (Col. 2, lines 40-50.)

At the two shaft lower ends 15, 16 are inwardly turned left and right stub shafts 21, 22, which normally extend horizontally inboard in alignment with each other to serve as the lateral pivot axes on which the skis 19, 20 are mounted. (Col. 2, line 65 – col. 3, line 2.) As shown in Figure 3, on turning the steering handle 10, the left stub shaft 21 is rotated in a plane *g* perpendicular to the axis *p* at the lower shaft end 15. This would bring the left ski 19 somewhat rearward and downward, assuming the snowmobile *a* was suspended. Simultaneously, the right stub shaft 22 is rotated forward and upwardly, thus raising the right ski 20, again, assuming the snowmobile *a* was suspended. (Col. 3, lines 17-24.)

As the snowmobile *a* is not suspended, it is in contact with the terrain when in operation, the effect of turning the skis 19, 20 is to tilt the snowmobile *a* as shown in Figure

2. Rotation, in the canted plane *g*, of the stub shaft 21 presses the outer ski 19 downward and increases the vertical projection of the shaft lower end 15 above the surface, raising the outer side of the snowmobile *a*. In contrast, rotating the stub shaft 22 at the inner side of the turn lessens the vertical distance from the shaft lower end 16 to the surface and lowers the inner side of the snowmobile *a*. The snowmobile *a* is thus banked as shown in Figure 2 and its center of gravity *c.g.* is brought slightly inward, increasing its resistance to overturning. (Col. 3, lines 25-38.)

Banking the snowmobile *a* also causes the belt *f* to tilt with the snowmobile *a* and, as shown in Figure 2, causes the lower edge of the belt *f* on the outer side of the turn to be raised slightly from the surface. Raising the outer edge of the belt *f* lessens the tendency of the snowmobile *a* to understeer erratically. (Col. 3, lines 44-52.)

In summarizing their invention, Christensen et al. state that a stable steering system is provided by a **pair of steering shafts** that extend slantingly forward and downward.<sup>2</sup> The steering shafts have inward extensions at their lower ends and skis are mounted to the inward extensions. Turning the two steering shafts alters the downward projection of the skis beneath the lower ends, lessening the downward projection of the ski on the inner side of the turn and increasing the downward projection of the ski on the outer side of the turn, thus banking the snowmobile into the turn. (Col. 1, lines 37-50.)

### 3. Atherley '380

Atherley '380 discloses a light-weight vehicle seat 10 having a base section 40 that is substantially rigid and provides support for the seat. A utility cavity 44 may be formed in the

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<sup>2</sup> The importance of the **pair of steering shafts** to the Christensen et al. snowmobile *a* cannot be emphasized enough. Not only is it the focal point of the description of the snowmobile *a*, each and every claim of Christensen et al. includes "a pair of steering shafts" sloping forwardly and downwardly.

base section 40 for holding various items. An access opening 48 is formed in the seat 10 to provide access to the utility cavity 40. The cavity may be left open to the vehicle shown at 50, so that heat generated by the vehicle can be used to maintain the temperature of items contained in the cavity. (See column 3, lines 17-57.)

In an alternate embodiment, the vehicle seat 100 has base section 102 and a seat section 104 removably disposed on the base section 102. The seat section 104 may be attached to the base section 102 with hook and loop type fasteners. Seat sections of various densities may be provided such that seats have varying degrees of flexibility. Thus, riders of various weight may select a seat section 104 of appropriate flexibility to suit their comfort.

4. Claims 1-21, 24, 77-87, 109, 113 and 114 Are Not Obvious Over AAPA in View of Christensen et al.

Claim 1 recites a snowmobile including a frame, a straddle-type seat disposed on the frame, first and second seat positions defined by the seat and an engine disposed on the frame in front of the seat, a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile, a forward-most drive track axle disposed on the frame, two skis disposed on the frame, a steering device having a steering position and steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the steering shaft is disposed over the engine at an angle  $\epsilon$  of less than  $45^\circ$  from vertical, the first seat position is disposed less than 590 mm behind the forward-most drive track axle and the second seat position is disposed behind the first seat position by between 265 mm and 365 mm and the steering position is disposed forward of the forward-most drive track axle.

The Office Action, on page 2, paragraph number 3, alleges that AAPA discloses “first, second and third seat positions on a singular [sic] defined by the seat (e.g., a first spot

and second spot on the seat)” and “a steering shaft (136) wherein the first seat position is disposed about 565 mm behind the forward most drive axle, the second seat position is disposed behind the first seat position by about 340 or 290 mm, the third seat position is disposed behind the second seat position by about 310- or 345 mm and the frame is between 1493 and 1913 mm long (See Figures 1 and 8 describing various measured distances on a conventional snowmobile, which measured distances in Figure 8 for the conventional snowmobile can meet the distances required by the claims).”

The Office Action, on page 3, paragraph number 5, alleges: “Christensen et al. disclose a snowmobile having a steering position (the position midway between handlebars 10) disposed forward of the forward-most drive axle (Figure 3 shows this configuration) and that the angle of the steering shaft is 33° from the vertical (col. 2, lines 43-45) in order to help provide a stable steering system (column 1, lines 37-38).”

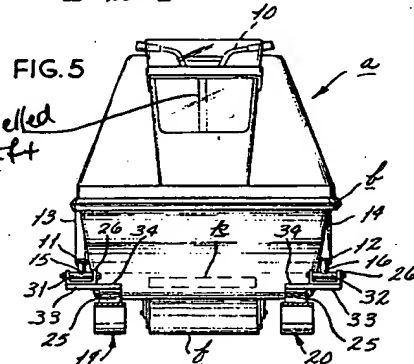
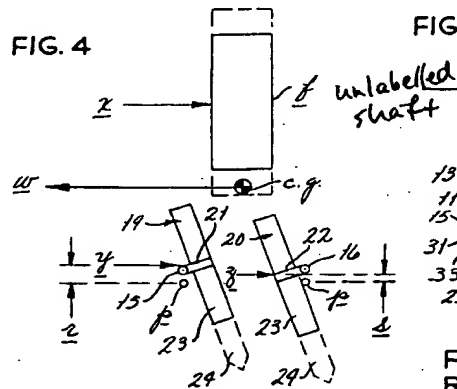
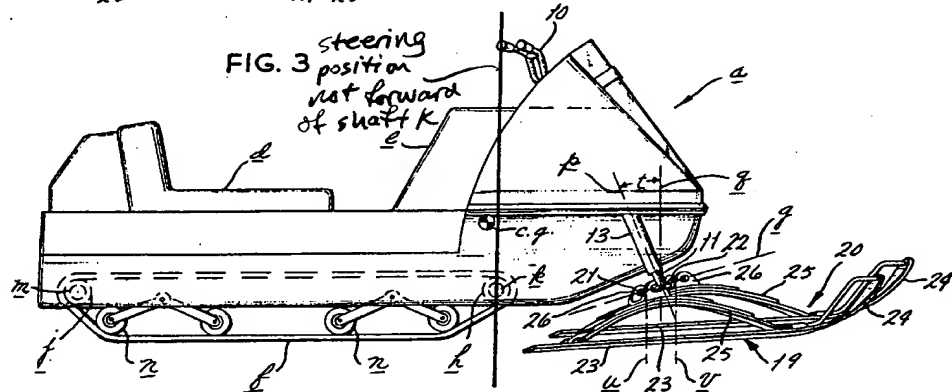
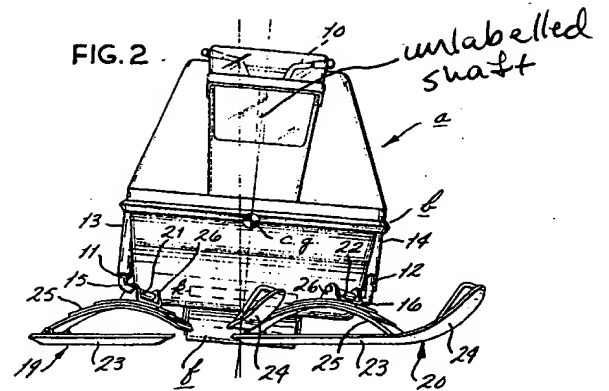
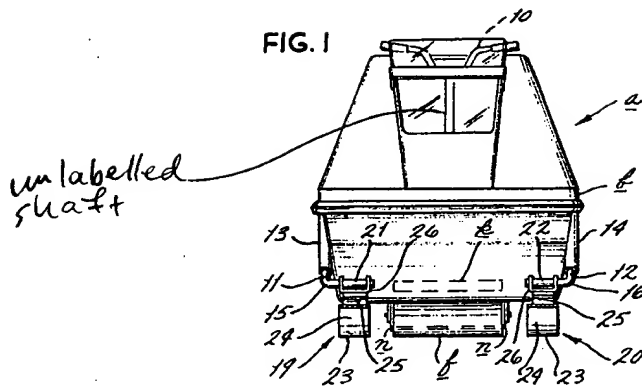
The Office Action on page 3, paragraph number 6, concludes: “It would have been obvious to one of ordinary skill in the art at the time of the invention to provide that the steering position is disposed forward of the forward most drive axle and a steering shaft having an angle of 33° from the vertical on the AAPA snowmobile as taught by Christensen et al., in order to construct a preferred snowmobile design and to help provide a stable steering system.”

The Office Action on page 3, paragraph number 7, states: “It is noted that since it has been held that discovering an optimum value of a result effective variable (for example an optimum angle of a steering shaft, various seat positions as measured from a forward-most drive axle or a distance between a steering position and a forward-most drive axle) involves only routine skill in the art.” The Office Action, in the first of many instances, then cites In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

MPEP § 2143 states: “To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teaching. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claimed limitations.”

MPEP §2143.01 states “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art.”

Figures 1-5 of Christensen et al. are included to illustrate various arguments regarding the scope and contents of Christensen et al.’s disclosure. Appellants have added annotations to aid in the discussion of Christensen et al. The annotations are clearly labelled.



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It is respectfully submitted that the combination of AAPA and Christensen et al. fails to establish a *prima facie case* of obviousness against claim 1 as: 1) the combination fails to include all the claim limitations; and 2) there is no motivation or suggestion in the references themselves or in the knowledge generally available to one of ordinary skill in the art to combine the reference teachings.

In previous Office Actions, the examiner had interpreted the term “steering device” to be a random spot on the steering device. (See, e.g., page 4, lines 2-3 of the October 8, 2002 Office Action and page 9, lines 5-10 of the April 7, 2003 Office Action.) It appears that the examiner is again relying on this interpretation. (See page 2, paragraph number 3 of the December 9, 2003 Office Action, which alleges that AAPA discloses “a steering device (e.g., the entire steering unit of 110) having a steering position (a spot on the steering device, 132).”) However, during the September 10, 2003 interview, it was agreed that the interpretation of the term “steering position” would be in accordance with Appellants’ definition of the term in the instant application as it was agreed that the steering position could not be any random spot on the steering device.

During the January 15, 2004 interviews, Appellants’ use of the term “steering position” was again discussed. As disclosed on page 8, paragraph [0041] of the instant application, the steering position is defined by a center of a portion of the steering device adapted to be held by the hands of the rider.

The December 9, 2003 Office Action states: “Christensen et al. disclose a snowmobile having a steering position (the position midway between handlebars 10) disposed forward of the forward-most drive track axle (Figure 3 shows this configuration) in order to help provide a stable steering system (column 1, lines 37-38).” (See page 4, paragraph number 11, of the December 9, 2003 Office Action.)

During the January 15, 2004 interview, Appellants' representatives argued that the interpretation given to the term "steering position" by the examiner was inconsistent with that defined by Appellants in the specification. As clearly shown, for example, by reference number 34 in Figure 2 of the instant application, the steering position is defined by a center of a portion of the steering device adapted to be held by the hands of the rider 26. (See also, for example, reference number 34 in Figures 3, 4A, 5, 6A and 7.) The steering position as defined by Appellants is not merely a point in the middle of a steering device, as alleged by the examiner. One of ordinary skill in the art would not reasonably interpret the term "steering position" as a point in the middle of a steering device because a rider of a snowmobile does not hold the steering device, whether it is a pair of handlebars, a yoke, or a steering wheel, at a point in the middle of the steering device.

Neither AAPA nor Christensen et al. disclose or suggest a steering position disposed forward of a forward-most drive track axle and the combination fails to establish a *prima facie* case of obviousness against claim 1. As clearly shown in Figure 1 of the instant application, the steering position 134 is disposed behind, not forward, the forward-most drive track axle 144.

As shown by annotation in Figure 3 of Christensen et al., the steering position defined by the steering handle 10 is not disposed forward of the shaft *k*. Even assuming that a steering position defined by the steering handle 10 of Christensen et al. is arguably shown forward of the shaft *k* in Figure 3, it is respectfully submitted that such an illustration is merely incidental to the disclosure of Christensen et al. and is of little value. The illustration is of little value as the drawings of Christensen et al. are not disclosed as "to-scale." See MPEP § 2125. In addition, there is no discussion whatsoever by Christensen et al. regarding the positioning of the steering handle 10 with respect to the shaft *k*.



It is respectfully submitted that the examiner's interpretation of the term "steering position" as a position midway between the handlebars 10 of Christensen et al. is contrary to MPEP §§ 2111 and 2111.01 as it is: 1) inconsistent with the broadest reasonable interpretation that those of ordinary skill in the art would reach and/or 2) inconsistent with the clear definition provided in the specification. It is also respectfully submitted that the examiner's interpretation is a strained attempt to have Christensen et al. "read on" claim 1. As discussed above, Figure 3 of Christensen et al. does not show a steering position disposed forward of the shaft *k* and, even assuming Figure 3 arguably shows such a configuration, Christensen et al. are completely silent as to the relationship between the steering handle 10 and the shaft *k*. Christensen et al. clearly do not disclose or suggest that the positional relationship between the steering handle 10 and the shaft *k* "helps provide a stable steering system" as alleged on page 4, paragraph number 11 of the Office Action.

Neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed less than 590 mm behind the forward-most drive track axle. As clearly shown in Figure 8 of the instant application, the distance that the first seat position of the conventional snowmobile is disposed behind the forward-most drive axle (defined as the distance D plus the distance A) is 905 mm (795 + 110) for a long frame conventional snowmobile and 905 mm (875 + 30) for a short frame conventional snowmobile. The first seat position of the conventional snowmobile shown in Figure 1 of AAPA is not disposed about 565 mm behind the forward-most drive axle, as alleged on page 3, paragraph number 5 of the Office Action. Christensen et al. are completely silent as to a distance that a seat position is spaced from the shaft *k*.

During the September 10, 2003 interview, Appellants explained the use of the term "seat position" throughout the instant application. As disclosed on page 8, paragraph [0039] of the instant application states that "the inventors of the present invention define the term

‘seat position’ to point out particular positions on the snowmobile that are adapted to function as the seat position for a standard rider.” This definition is consistent with the understanding of one of ordinary skill in the art.

Examiner Luby indicated that the term “seat position” could be broadly interpreted as any position along the seat of the snowmobile. Appellants respectfully disagreed. As demonstrated during the September 10, 2003 interview, a snowmobile can not be operated by the rider seated at any position along the seat of the snowmobile. It would be extremely difficult, if not impossible, to operate the conventional snowmobile 110 of Figure 1 seated at a position less than about 590 mm from the forward-most drive track axle 144 as the configuration of the snowmobile 110, including the steering position 134 provided by the steering shaft 136 being at an angle greater than or equal to 45° to vertical, would not permit operation of the snowmobile 110 from the claimed distance. Such extreme difficulty was clearly demonstrated by Mr. Girouard, the first named inventor, during the interview.

During the January 15, 2004 interview, the term “seat position” was again discussed. Examiners Morris, Boehler and Luby took the position that the combined center of gravity of the snowmobile and the rider, or riders, of the conventional snowmobile (depicted by reference number 172 in Figure 1) could be interpreted as the “seat position.” Under this interpretation, the examiners indicated that the seat position of the conventional snowmobile would be 400 mm for a long frame conventional snowmobile (the distance A (290 mm) plus the distance J (110 mm) in Figure 8) and 310 mm for a short frame conventional snowmobile (the distance A (280 mm) plus the distance J (30 mm) in Figure 8).

It is respectfully submitted that the interpretation of the combined center of gravity of the conventional snowmobile and the riders is as improper and contrary to PTO policy as the examiner’s previous interpretation of the seat position as any position along the seat.

Appellants have defined the term “seat position” consistently with the understanding of one of ordinary skill in the art. MPEP § 2111 states: “During patent examination, the pending claims must be ‘given the broadest reasonable interpretation consistent with the specification.’” (Emphasis added.) MPEP § 2111 also states: “the ‘PTO applies to verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definition or otherwise that may be afforded by the written description contained in applicant’s specification.’” (Emphasis added.) MPEP § 2111.01 states: “During examination, the claims must be interpreted as broadly as their terms reasonably allow. This means that the words of the claim must be given their plain meaning unless applicant has provided a clear definition in the specification.” (Emphasis added.)

It is respectfully submitted that the examiner’s refusal to give pending claims the broadest reasonable interpretation consistent with the specification and the understanding of one of ordinary skill in the art is improper and contrary to Patent Office policy as set forth in MPEP § 2111. Appellants have clearly and unambiguously set forth the metes and bounds of the term “seat position” and Appellants respectfully submit that the examiner’s insistence on interpreting this term as the combined center of gravity 172 of the conventional snowmobile and riders is clearly inconsistent with the specification, inconsistent with the broadest reasonable interpretation that one of ordinary skill in the art would reach and, therefore, improper.

MPEP § 2141 states: “Patent examiners carry the responsibility of making sure that the standard of patentability enunciated by the Supreme Court and by the Congress is applied in each and every case.” (Emphasis in original.) MPEP § 2141 further states: “Office policy is to follow Graham v. John Deere Co. in the consideration and determination of obviousness

under 35 U.S.C. §103. As quoted above, the four factual inquiries enunciated therein as a background for determining obviousness are as follows: (A) Determining the scope and contents of the prior art; (B) Ascertaining the differences between the prior art and the claims in issue; (C) Resolving the level of ordinary skill in the pertinent art; and (D) Evaluating evidence of secondary considerations.”

In the instant application, the examiner has failed to determine the scope and contents of the prior art because the examiner has mischaracterized AAPA by interpreting the combined center of gravity 172 of AAPA snowmobile as the seat position. Appellants clearly disclosed the seat position of AAPA by reference number 152 in Figure 1. Appellants have never admitted that the combined center of gravity is a seat position.

The examiner has also failed to ascertain the differences between the prior art and the claims by mischaracterizing the dimensions for the conventional snowmobile shown in Figure 8. What Appellants have disclosed in Figure 8 are the relative relationships between the various components of the conventional snowmobile 110 in comparison with the relative relationships of the various components of the disclosed embodiments of the inventive snowmobile. Reinterpreting or recharacterizing the disclosed positions (e.g., seat position, center of gravity, etc.) and the associated dimensions of the conventional snowmobile 110, without also reinterpreting or recharacterizing the inventive positions and dimensions, completely distorts the relationships disclosed in Figure 8 to the point that what the examiner is combining with Christensen et al. is not Appellants’ admitted prior art.

The conventional snowmobile shown in Figure 1 of the instant application clearly does not disclose or suggest a first seat position less than 590 mm behind the forward-most drive track axle, as recited in claim 1. The examiner has simply chosen another disclosed position on the conventional snowmobile in an attempt to have the conventional snowmobile

“read on” claim 1. This is clearly improper as Appellants have not admitted that the combined center of gravity 172 is a seat position. The examiner’s allegation that Appellants’ admitted prior art discloses a snowmobile having a first seat position disposed about 565 mm behind the forward-most drive axle is simply incorrect. Appellants have never made such an admission.

It is respectfully submitted that the examiner has failed to carry the responsibility of applying the standard of patentability in the instant application and the combination of “AAPA” and Christensen et al. fails to disclose or suggest all the claim limitations and fails to establish a *prima facie* case of obviousness against claim 1.

Claim 1 recites that the steering shaft is disposed over the engine at an angle  $\epsilon$  of less than  $45^\circ$  from vertical. This feature is neither disclosed or suggested by AAPA or Christensen et al.

As clearly shown in Figure 8 of the instant application, the steering shaft 136 of the conventional snowmobile 110 is disposed at an angle  $\epsilon$  to vertical that is greater than or equal to  $45^\circ$ .

The Office Action alleges that Christensen discloses “that the angle of the steering shaft is  $33^\circ$  from the vertical (col. 2, lines 43-45.)” (Page 3, paragraph number 5 of the Office Action.) Christensen et al., however, do not disclose or suggest a steering shaft disposed over the engine at an angle  $\epsilon$  of less than  $45^\circ$  from vertical, as recited in claim 1. In Christensen et al.’s snowmobile *a*, two steering shafts 11, 12 are affixed to the structure *b* of the snowmobile *a* on outboard sides, preferably farther outboard than is conventional. (Col. 2, lines 32-40 (emphasis added)). Neither of the two outboard steering shafts 11, 12 is disposed over the engine. Therefore, the examiner’s conclusion that Christensen et al.

disclose this feature is, once again, a failure to determine the scope and contents of the prior art.

As shown in Figures 1, 2 and 5, Christensen et al. illustrate an unlabelled shaft extending from the steering handle 10 disposed generally along the fore-and-aft center line of the snowmobile *a* and extending through the central mechanism enclosure *e*. There is nothing in the drawings that would suggest what angle the unlabelled shaft is from vertical. Even assuming such an angle from vertical were shown in the drawings, as Christensen et al.'s drawings are not disclosed as "to-scale," such an illustration would be of little value. See MPEP § 2125.

As shown in Figures 1-3 and 5, there is no illustrated structure linking the steering handle 10 and the unlabelled shaft to the two outboard steering shafts 11, 12. The text merely states that the steering handle 10 is connected by a "conventional linkage" to the two outboard steering shafts 11, 12. (Col. 2, lines 30-33.)

Christensen et al. disclose nothing about the position of the steering handle 10 in relation to the forward shaft *k* with respect to providing a stable steering system. Christensen et al. merely incidentally illustrate the steering handle 10 with a portion at a position that is arguably forward of the shaft *k*. As discussed above, Christensen et al. disclose that the linkage (including the unlabelled shaft) between the steering handle 10 and the two outboard steering shafts 11, 12 is "conventional." Christensen et al. do not disclose or suggest that this "conventional linkage" in any way provides, or in any way contributes to the provision of, a stable steering system. In summarizing their invention, Christensen et al. clearly state that it is the provision of the **pair of outboard steering shafts 11, 12**, including the lower end inward extensions that bank the snowmobile into a turn, that provides their stable steering system. There is absolutely nothing in the disclosure of Christensen et al. that would suggest

to or motivate one of ordinary skill in the art to place the steering position 134 of the conventional snowmobile 110 forward of the forward-most drive track axle 144. There is also nothing in the disclosure of Christensen et al. that would suggest to or motivate one of ordinary skill in the art to modify the angle  $\epsilon$  from vertical of the steering shaft 136 of the conventional snowmobile 110 from greater than or equal to  $45^\circ$  to less than  $45^\circ$ , as recited in claim 1.

During the January 15, 2004 interview, the undersigned argued that there is no disclosure or suggestion of the angle with respect to vertical of the unlabelled steering shaft shown in Figures 1, 2 and 5 of Christensen et al. SPE Morris stated that the unlabelled steering shaft of Christensen et al. “must be”  $25^\circ$  from vertical because the outboard steering shafts 11 and 12 are  $25^\circ$  from vertical. Appellants respectfully disagree.

As discussed above, Christensen et al. merely disclose that the steering handle 10 is connected to the outboard steering shafts 11 and 12 by a conventional linkage not shown in the drawings. (Col. 2, lines 30-33.) There is nothing in the disclosure of Christensen et al. that would lead one of ordinary skill in the art to conclude that the unlabelled steering shaft “must be”  $25^\circ$  from vertical. Even assuming that SPE Morris was relying on the theory of inherency for her conclusion, no basis in fact or technical reasoning to support the conclusion that the unlabelled steering shaft of Christensen is necessarily  $25^\circ$  from vertical has been provided, as required by MPEP § 2112.

As neither AAPA nor Christensen et al. disclose or suggest a steering shaft disposed over the engine at an angle  $\epsilon$  of less than  $45^\circ$  from vertical, the combination fails to include all the claim limitations and fails to establish a *prima facie* case of obviousness against claim 1.

It is also respectfully submitted that there is no suggestion or motivation to combine AAPA and Christensen et al. The examiner's determination on page 3, paragraph number 5 of the Office Action, that Christensen et al. disclose a snowmobile having a steering position disposed forward of the forward-most drive axle and a steering shaft at an angle of 33° from vertical "in order to help provide a stable steering system" is, quite simply, wishful thinking. It is also another failure to carry out Patent Office policy by failing to correctly determine the scope and content of the prior art.

There is also nothing in the disclosure of Christensen et al. that would suggest to or motivate one of ordinary skill in the art to modify the angle  $\epsilon$  of the steering shaft 136 of the conventional snowmobile 110 of Figure 1 from greater than or equal to 45° from vertical to less than 45° from vertical. The two outboard steering shafts 11, 12 of Christensen et al. are not disposed over the engine, they are provided on outboard sides of the structure *b* of Christensen et al.'s snowmobile *a*. It is respectfully submitted that the examiner's combination of AAPA with Christensen et al. fails to resolve the level of ordinary skill in the art as required by MPEP § 2141 and is nothing more than an attempt to reconstruct the claimed invention through reliance on impermissible hindsight.

With respect to the allegation on page 3, paragraph number 7, where it is noted that discovering optimum values of a result-effective variable involves only routine skill in the art and the examiner relies on the decision of In re Boesch to support the obviousness determination, MPEP § 2144 states: "If the facts in a prior legal decision are sufficiently similar to those in an application under examination, the examiner may use the rationale used by the court. If the applicant has demonstrated the criticality of a specific limitation, it would not be appropriate to rely solely on case law as the rationale to support an obviousness rejection." (Emphasis in original.)



In re Boesch (copy enclosed) dealt with a claimed nickel based alloy in which each of the claimed ranges was clearly overlapped by the combination of two prior art references. Applicants argued that neither reference recognized the problem they had solved (reduction of a sigma phase which embrittled the alloy) and submitted an affidavit of Boesch alleging that the claimed alloy produced unexpected results. The court agreed with the examiner and the Board that the claimed alloy was obvious because 1) the claimed ranges were all overlapped by the combination of the two prior art references and 2) a third reference suggested reducing the sigma phase of nickel based alloys.

It is respectfully submitted that the facts of In re Boesch are not sufficiently similar to those of the instant application to permit the examiner to rely on the rationale used by the court. Firstly, the claimed features, in particular the distance of the first seat position behind the forward-most drive track axle and the angle of a steering shaft disposed over an engine, are not disclosed, or overlapped, by the combination of AAPA and Christensen et al. As discussed above, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed less than 590 mm behind the forward-most drive track axle or a steering shaft disposed over an engine at an angle  $\epsilon$  of less than  $45^\circ$  from vertical.

Secondly, MPEP § 2144.05 states: "A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." The MPEP cites the same case law, In re Antonie, 559 F.2d618, 195 USPQ 6 (CCPA 1978), where the court relied on In re Boesch.

It is respectfully submitted that there is no recognition by AAPA or Christensen et al. that varying the angle of the steering shaft, the distances of the seat positions as measured from a forward-most drive axle, or the distance between the steering position and the

forward-most drive axle will affect the results of the operation of the snowmobile of either AAPA or Christensen et al. The examiner has provided absolutely no support and has not cited a single passage of either AAPA or Christensen et al. that supports the proposition that adjusting the angle of the steering shaft (including the steering shaft 136 of the conventional snowmobile 110 or the two outboard steering shafts 11, 12 and/or the unlabelled shaft connected to the steering device 10 of Christensen et al.), the seat positions from the forward-most drive axle, or the distance between the steering position and forward-most drive axle would in any way achieve a recognized result.

As discussed during the January 15, 2004 interview, it appears to be the position of the examiner that, despite all the disclosure by Christensen et al. of the outboard steering shafts 11 and 12 being provided to bank the snowmobile into a turn, the one modification that one of ordinary skill in the art would make to the conventional snowmobile 110 is to move the steering position 134 forward of the forward-most drive track axle 144, based on the incidental disclosure of this relationship being arguably illustrated in Figure 3 of Christensen et al. Appellants respectfully submit that this is clearly an impermissible hindsight reconstruction of the claimed invention completely unsupported by the disclosure of AAPA and Christensen et al.

Even assuming that Figure 3 clearly showed a steering position of the steering handle 10 of Christensen et al. disposed forward of the shaft *k*, the examiner has failed to provide any motivation, other than "to help provide a stable steering system," for the combination of AAPA and Christensen et al. As discussed above, Christensen et al. are completely silent as to how the relationship of the steering handle 10 and the shaft *k* affects the steering of the snowmobile. Motivation to combine Christensen et al. with AAPA simply does not exist.

Thirdly, Appellants have clearly disclosed that providing the steering shaft over the engine at an angle less than  $45^{\circ}$  to vertical and providing a first seat position less than 590 mm behind the forward-most drive track axle provides minimizes the effect of the snowmobile's movement on the driver and passenger(s) as they pass over uneven terrain. (See, e.g., page 2, paragraph [0009] of the instant application. See also, e.g., page 9, paragraphs [0044] – [0046].) Accordingly, the examiner's reliance solely on the rationale used by the court in determining the obviousness of the claimed invention is clearly improper.

Claim 1 is not anticipated by Christensen et al. because Christensen et al. do not disclose or suggest a snowmobile having a steering shaft disposed over the engine at an angle less than  $45^{\circ}$  from vertical, a first seat position disposed less than 590 mm behind a forward-most drive track axle, and a steering position disposed forward of the forward-most drive track axle. With respect to the steering shaft disposed over the engine, although Christensen et al. disclose an engine (col. 2, line 15), it is not shown. Accordingly, the engine could be positioned at the rear of the snowmobile, in which case the unlabelled steering shaft would not be disposed over the engine.

Claim 2 recites that the angle  $\epsilon$  is between  $25^{\circ}$  and  $40^{\circ}$  from vertical. Neither AAPA nor Christensen et al. disclose or suggest this feature. As discussed above, the angle  $\epsilon$  of AAPA as shown in Figure 8 is greater than or equal to  $45^{\circ}$ . The two outboard steering shafts 11, 12 of Christensen et al. are disposed at approximately  $25^{\circ}$  more or less to vertical, but, being outboard of the engine, are not disposed over the engine. There is also no disclosure or suggestion by Christensen et al. that varying the angle  $t$  would achieve any result, let alone the result recognized by the present invention. Christensen et al. disclose nothing about the angle of the unlabelled shaft extending from the steering handle 10. As the combination of

AAPA and Christensen et al. fails to include all the claim limitations, the combination fails to present a *prima facie* case of obviousness against claim 2.

Claim 3 recites that the angle  $\varepsilon$  is between 30° and 35° from vertical. Neither AAPA nor Christensen et al. disclose or suggest this feature. The combination of AAPA and Christensen et al. thus fails to present a *prima facie* case of obviousness against claim 3.

Claim 4 recites that the angle  $\varepsilon$  is 33° from vertical. Neither AAPA nor Christensen et al. disclose or suggest this feature. The combination of AAPA and Christensen et al. thus fails to present a *prima facie* case of obviousness against claim 4.

With respect to claim 5, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed behind the forward-most drive track axle between 550 mm and 580 mm. As discussed above, the first seat position 152 of the conventional snowmobile 110 is disposed 905 mm behind the forward-most drive track axle 144 for both the long frame and the short frame. The examiner's interpretation of the combined center of gravity 172 of the conventional snowmobile of Figure 1 is contrary to PTO policy on claim interpretation. Christensen et al. are completely silent as to a seat position disposed behind the shaft *k*. As the combination of AAPA and Christensen et al. fails to include all the claim limitations, the combination fails to present a *prima facie* case of obviousness against claim 5.

With respect to claim 6, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed behind the forward-most drive track axle between 560 mm and 570 mm. The combination thus fails to present a *prima facie* case of obviousness against claim 6.

With respect to claim 7, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed behind the forward-most drive track axle about 565 mm. The combination thus fails to present a *prima facie* case of obviousness against claim 7.

With respect to each of claims 8-10, although Figure 8 discloses that the the second seat position of the conventional snowmobile 110 is disposed behind the first seat position by 340 mm (between 325 mm and 355 mm and between 335 mm and 345 mm), the disclosure is insufficient to cure the deficiencies of the combination of AAPA and Christensen et al. discussed above and the combination fails to present a *prima facie* case of obviousness against each of claims 8 -10.

Claim 11 recites that the second seat position is disposed behind the first seat position by between 275 mm and 305 mm. Claim 12 recites that the distance between 285 mm and 295 mm. Claim 13 recites that the distance is about 290 mm.

As shown in Figure 8, the second seat position of the conventional snowmobile of AAPA is disposed 340 mm (distance F) behind the first seat position for both a long frame conventional snowmobile and a short frame conventional snowmobile. 340 mm is not between 275 mm and 305 mm as recited in claim 11, nor is it between 285 mm and 295 mm as recited in claim 12, nor is it about 290 mm as recited in claim 13. Christensen et al. provide no disclosure, suggestion or motivation for a second seat position between 275 mm and 305 mm, between 285 mm and 295 mm, or about 290 mm behind a first seat position. The combination of AAPA and Christensen et al. thus fails to present a *prima facie* case of obviousness against each of claims 11-13.

Claim 14 recites that the snowmobile further comprises a third seat position on the seat, wherein the third seat position is disposed behind the second seat position by between 285 mm and 370 mm.

Page 2, paragraph [0066] of the instant application discloses, that while it would be desirable to add a third seat to accommodate a second passenger (third rider), it has not been done because the riders are positioned so far back on the conventional snowmobile 110 that a third rider would experience prohibitively large jostling forces. Appellants have never admitted that the conventional snowmobile 110, disclosed and discussed throughout the instant application, includes a third seat position. The examiner's determination that AAPA discloses a third seat position is, once again, a refusal on the part of the examiner to properly interpret the claim language in accordance with Patent Office policy as set forth in MPEP § 2111 and a failure to determine the scope and contents of the prior art as required by MPEP § 2141.

Christensen et al. do not disclose or suggest a third seat position on the snowmobile. Christensen et al. merely disclose a driver's seat. (Col. 2, line 19.) The combination of AAPA and Christensen et al. thus fails to establish a *prima facie* case of obviousness against claim 14.

With respect to claim 15, neither AAPA nor Christensen et al. disclose or suggest a third seat position disposed behind a second seat position between 295 mm and 325 mm.

With respect to claim 16, neither AAPA nor Christensen et al. disclose or suggest a third seat position disposed behind a second seat position between 305 mm and 315 mm.

With respect to claim 17, neither AAPA nor Christensen et al. disclose or suggest a third seat position disposed behind a second seat position about 310 mm.

With respect to claim 18, neither AAPA nor Christensen et al. disclose or suggest a third seat position disposed behind a second seat position between 330 mm and 360 mm.

With respect to claim 19, neither AAPA nor Christensen et al. disclose or suggest a third seat position disposed behind a second seat position between 340 mm and 350 mm.

With respect to claim 20, neither AAPA nor Christensen et al. disclose or suggest a third seat position disposed behind a second seat position about 345 mm.

Claim 21 recites that the first and second seat positions are disposed on a singular seat unit. Although AAPA discloses a first and second seat position disposed on a singular seat unit, the disclosure is insufficient to cure the deficiencies of the combination of AAPA and Christensen et al. discussed above and the combination fails to present a *prima facie* case of obviousness against claim 21 for the reasons set forth above in connection with claim 1.

With respect to claim 24, neither AAPA nor Christensen et al. disclose or suggest first, second and third seat positions disposed on a singular seat unit. As discussed above, AAPA actually teaches away from this feature on page 2, paragraph [0006] of the instant application. The examiner's combination of AAPA and Christensen et al. is, thus, a failure to determine the scope and contents of the prior art and a failure to evaluate the evidence of secondary considerations as required by MPEP § 2141.

Claim 109 depends from claim 1 and recites that the snowmobile further includes a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

Although AAPA discloses A-arm suspension and trailing suspension systems, it is respectfully submitted that the combination of AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against claim 109 as there is no suggestion or motivation,

either in AAPA, Christensen et al., or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings.

AAPA discloses A-arm and trailing arm suspensions operatively connecting the two skis to the snowmobile frame.

Christensen et al. disclose two outboard steering shafts 11, 12 including inwardly directed stub shafts 21, 22 at the lower ends 15, 16 which normally extend horizontally inboard in alignment with each other. Each of the stub shafts 21, 22 is connected to a semi-elliptic spring 25. The semi-elliptic springs 25 are connected to the two skis 19, 20 by trunnion fittings 26. Securing the stub shafts 21, 22 on upper portions of the springs 25 establishes a spaced vertical projection of the shaft lower ends 15, 16 above the surface on which the surface-contacting portions 23, 24 of the skis 19, 20 rest. (Col. 2, line 65 – col. 3, line 16.)

When the steering handle 10 is turned, the stub shaft 21 is rotated in a plane  $g$  perpendicular to the axis  $p$ . Assuming the snowmobile  $a$  was suspended, the ski 19 would rotate rearwardly and downwardly. Simultaneously, the stub shaft 22 would rotate forwardly and upwardly and move the ski 20 forwardly and upwardly. (Col. 3, lines 17-24.)

The snowmobile  $a$  of Christensen et al., however, is not suspended. Turning the steering handle 10 causes the left stub shaft 21 at the outer side to rotate in the plane  $g$  and moves the center of the trunnion fitting 26 rearward. The outer ski 19 is pressed downwardly and the vertical projection of the shaft lower end 15 is increased. The outer side of the snowmobile  $a$  is raised. On the inner side, turning the steering handle 10 rotates the stub shaft 22 in the plane  $g$ , decreases the vertical projection of the shaft lower end 16, and lowers the inner side of the snowmobile  $a$ . The snowmobile  $a$  is banked as shown in Figure 2, its



center of gravity *c.g.* is brought inward and the snowmobile's resistance to overturning is increased. The driver need not learn to lean inward. (Col. 3, lines 25-38.)

It is respectfully submitted that one of ordinary skill in the art would not have been motivated to combine the teachings of AAPA and Christensen et al. AAPA discloses an A-arm or trailing arm suspension (as illustrated in Figure 1) operatively connecting the skis 116 to the frame of the snowmobile 110. The steering shaft 136 operatively connects the steering device 132 to the skis 116.

In contrast, Christensen et al. disclose a suspension, i.e. the semi-elliptic springs 25, operatively connecting the skis 19, 20 to the steering shafts 11, 12 (through the stub shafts 21, 22 and the trunnion fittings 26). The suspension (semi-elliptic springs 25) of Christensen et al., thus, operatively connects the skis 19, 20 to the steering handle 10, not to the structure *b* of the snowmobile *a*.

The conventional snowmobile 110 of AAPA and the snowmobile *a* of Christensen et al. operate in fundamentally different ways. AAPA discloses a front suspension system operatively connecting the two skis 116 to a frame, not to the steering device 132. Accordingly, the driver has to lean into a turn in order to effectively turn the snowmobile 110. Christensen et al. disclose a suspension operatively connecting the two skis 19, 20 to the steering handle 10, not to the structure *b* of the snowmobile *a*. The connection of the skis 19, 20 to the steering handle 10 banks the snowmobile *a* into turns and the driver does not lean into the turn.

One of ordinary skill in the art would not have been motivated by Christensen et al. to modify the conventional snowmobile 110 of AAPA by operatively connecting the skis 116 to the steering device 132. Such a modification would result in a change in the principle of operation of the conventional snowmobile 110. See MPEP § 2143.01.

Likewise, one of ordinary skill in the art would not have been motivated by AAPA to modify the snowmobile *a* of Christensen et al. In fact, it is respectfully submitted that modifying the snowmobile *a* of Christensen et al. by operatively connecting the semi-elliptic springs 25 to the structure *b*, and not the steering shafts 11, 12, would render the snowmobile *a* of Christensen et al. unsatisfactory for its intended purpose, or even inoperable. See MPEP §§ 2143.01 and 2145 III. The snowmobile *a* of Christensen et al. can only be banked and turned by connecting the semi-elliptic springs 25 to the steering shafts 11, 12.

Claim 77 recites a snowmobile including a frame; a straddle-type seat disposed on the frame; a seat position defined by the seat; an engine disposed on the frame in front of the seat; a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile; a forward-most drive track axle disposed on the frame; two skis disposed on the frame; a steering device having a steering position; and a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the steering shaft is disposed over the engine at an angle  $\epsilon$  of less than  $45^\circ$  from vertical, the steering position is disposed forward of the forward-most drive track axle and the seat position is disposed less than 590 mm behind the forward-most drive track axle.

Neither AAPA nor Christensen et al. disclose or suggest a steering position disposed forward of a forward-most drive track axle, as recited in claim 77.

Moreover, neither AAPA nor Christensen et al. disclose or suggest a snowmobile including a seat position disposed less than 590 mm behind a forward-most drive track axle. Appellants respectfully submit that the what the examiner has combined with Christensen et al. is not Appellants' admitted prior art. What the examiner has combined with Christensen et al. is an improper misinterpretation, or a deliberate mischaracterization, of Appellants' admitted prior art.

In addition, neither AAPA nor Christensen et al. disclose a steering shaft disposed over the engine at an angle  $\epsilon$  less than 45° from vertical. The combination thus fails to include all the claim limitations and fails to present a *prima facie* case of obviousness against claim 77.

There is also no suggestion or motivation, either in AAPA, Christensen et al., or in the knowledge generally available to one of ordinary skill in the art, to combine the teachings of AAPA and Christensen et al. The combination is nothing more than an attempt to reconstruct the claimed invention through the use of impermissible hindsight.

Christensen et al. do not anticipate or render obvious claim 77 as there is no disclosure or suggestion of a steering shaft disposed over the engine at an angle of less than 45° from vertical or a seat position disposed less than 590 mm behind the forward-most drive track axle.

Claim 78 recites that the angle  $\epsilon$  is between 25° and 40° from vertical. Neither AAPA nor Christensen et al. disclose or suggest this feature. The angle  $\epsilon$  of AAPA as shown in Figure 8 is greater than or equal to 45°. The two outboard steering shafts 11, 12 of Christensen et al. are disposed at approximately 25° more or less to vertical, but are not disposed over the engine and there is no disclosure regarding the angle of the unlabelled shaft extending from the steering handle 10. As the combination of AAPA and Christensen et al. fails to include all the claim limitations, the combination fails to present a *prima facie* case of obviousness against claim 78.

Claim 79 recites that the angle  $\epsilon$  is between 30° and 35° from vertical. Neither AAPA nor Christensen et al. disclose or suggest this feature. The combination of AAPA and Christensen et al. thus fails to present a *prima facie* case of obviousness against claim 79.

Claim 80 recites that the angle  $\epsilon$  is  $33^\circ$  from vertical. Neither AAPA nor Christensen et al. disclose or suggest this feature. The combination of AAPA and Christensen et al. thus fails to present a *prima facie* case of obviousness against claim 80.

With respect to claim 81, neither AAPA nor Christensen et al. disclose or suggest a seat position disposed behind the forward-most drive track axle between 550 mm and 580 mm. As discussed above, the seat position 152 of the conventional snowmobile 110 is disposed 905 mm behind the forward-most drive track axle 144 for both the long frame and the short frame and the examiner's interpretation of the combined center of gravity 172 of the conventional snowmobile 110 as a seat position is inconsistent with the specification and a reasonable interpretation by those of ordinary skill in the art. The interpretation is also contrary to PTO policy on claim interpretation. Christensen et al. are completely silent as to a seat position disposed behind the shaft *k*. As the combination of AAPA and Christensen et al. fails to include all the claim limitations, the combination fails to present a *prima facie* case of obviousness against claim 81.

With respect to claim 82, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed behind the forward-most drive track axle between 560 mm and 570 mm. The combination thus fails to present a *prima facie* case of obviousness against claim 82.

With respect to claim 83, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed behind the forward-most drive track axle about 565 mm. The combination thus fails to present a *prima facie* case of obviousness against claim 83.

In addition, there is no recognition by either AAPA or Christensen et al. that the angles of the steering shaft recited in each of claims 78-80 and the distances of the seat

position from the forward-most drive track axle in claim 81-83 are result effective variables. Accordingly, the examiner's reliance solely on the rationale used by the court in In re Boesch for the determination of obviousness in each of the claims is clearly improper under MPEP § 2144.

Claim 113 depends from claim 77 and recites that the snowmobile further includes a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

One of ordinary skill would not have been motivated by Christensen et al. to modify the conventional snowmobile 110 so as to change its principle of operation, nor would one of ordinary skill in the art have been motivated by AAPA to modify the snowmobile *a* of Christensen et al. so as to render it unsatisfactory for its intended purpose, or inoperable. The combination of AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against claim 113.

Claim 84 recites a snowmobile including a frame; a straddle-type seat disposed on the frame; a seat position defined by the seat; an engine disposed on the frame in front of the seat; a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile; a forward-most drive track axle disposed on the frame; two skis disposed on the frame; a steering device having a steering position; and a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the steering shaft is disposed over the engine at an angle  $\epsilon$  of less than 45° from vertical and the steering position is disposed forward of the forward-most drive track axle.

Neither AAPA nor Christensen et al. disclose or suggest a steering position disposed forward of a forward-most drive track axle.

Neither AAPA nor Christensen et al. disclose or suggest a snowmobile including a steering shaft operatively connecting two skis to a steering device disposed over an engine at an angle  $\epsilon$  of less than  $45^\circ$  from vertical. The combination fails to include all the claim limitations and fails to present a *prima facie* case of obviousness against claim 84.

There is no suggestion or motivation, either in AAPA, Christensen et al., or in the knowledge generally available to one of ordinary skill in the art, to combine the teachings of AAPA and Christensen et al. AAPA discloses a steering shaft 136 over the engine at an angle of greater than or equal to  $45^\circ$  and Christensen et al. disclose two outboard steering shafts 11, 12 connected to a steering handle 10 through an unlabelled shaft and a “conventional linkage.” The combination proposed by the examiner is nothing more than an impermissible hindsight reconstruction of the claimed invention and fails to present a *prima facie* case of obviousness against claim 84.

Christensen et al. do not anticipate or render obvious claim 84 as there is no disclosure or suggestion of a steering shaft disposed over the engine at an angle less than  $45^\circ$  from vertical or a steering position disposed forward of the forward-most drive track axle.

Claim 85 recites that the angle  $\epsilon$  is between  $25^\circ$  and  $40^\circ$  from vertical. Neither AAPA nor Christensen et al. disclose or suggest this feature. The angle  $\epsilon$  of AAPA as shown in Figure 8 is greater than or equal to  $45^\circ$ . The two outboard steering shafts 11, 12 of Christensen et al. are disposed at approximately  $25^\circ$  more or less to vertical, but are not disposed over the engine and there is no disclosure regarding the angle of the unlabelled shaft extending from the steering handle 10. As the combination of AAPA and Christensen et al. fails to include all the claim limitations, the combination fails to present a *prima facie* case of obviousness against claim 85.

Claim 86 recites that the angle  $\varepsilon$  is between 30° and 35° from vertical. Neither AAPA nor Christensen et al. disclose or suggest this feature. The combination of AAPA and Christensen et al. thus fails to present a *prima facie* case of obviousness against claim 86.

Claim 87 recites that the angle  $\varepsilon$  is 33° from vertical. Neither AAPA nor Christensen et al. disclose or suggest this feature. The combination of AAPA and Christensen et al. thus fails to present a *prima facie* case of obviousness against claim 80.

There is also no recognition by either AAPA or Christensen et al. that the angles of the steering shaft recited in each of claims 85-87 is a result effective variable. Accordingly, the examiner's reliance solely on the rationale used by the court in In re Boesch for the determination of obviousness in each of the claims is clearly improper under MPEP § 2144.

Claim 114 depends from claim 84 and recites that the snowmobile further includes a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

One of ordinary skill would not have been motivated by Christensen et al. to modify the conventional snowmobile 110. One of ordinary skill in the art also would not have been motivated by AAPA to modify the snowmobile a of Christensen et al. The respective snowmobiles operate in fundamentally different ways and any such modification would result in a change in the principle of operation of the snowmobiles, render the snowmobiles unsatisfactory for their intended purposes, or inoperable.

5. Claims 26-32, 37-47, 50 and 110 Are Not Obvious Over AAPA in View of Christensen et al.

Claims 26 recites a snowmobile including a frame, a straddle-type seat disposed on the frame, first and second seat positions defined by the seat, an engine disposed on the frame in front of the seat, a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile, a forward-most drive track axle disposed on the frame, a steering device having a steering position, two skis disposed on the frame and operatively connected to the steering device, and a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the steering position is disposed forward of the forward-most drive track axle, a horizontal distance between the forward-most drive track axle and the first seat position is less than 590 mm, and the second seat position is disposed behind the first seat position by between 265 mm and 365 mm.

AAP does not disclose or suggest a steering position disposed forward of a forward-most drive track axle. Christensen et al. do not disclose or suggest a steering position disposed forward of a forward-most drive track axle.

The Office Action on page 4, paragraph number 9, alleges that AAPA discloses “the first seat position is disposed about 565 mm behind the forward most drive axle, the second seat position is disposed behind the first seat position by about 290 or 340 mm, the third seat position is disposed behind the second seat position by about 310 or 345 mm.”

AAPA does not disclose or suggest a horizontal distance between the forward-most drive track axle 144 and the first seat position 152 is less than 590 mm, as recited in claim 26. As clearly shown in Figure 8 of the instant application, the horizontal distance between the forward-most drive track axle 144 and the first seat position 152 (the distance D + the distance A) is 905 mm for both a long frame (795 + 110) and a short frame (875 + 30)



snowmobile. The examiner's conclusion that "the measured distances in Figure 8 for the conventional snowmobile can meet the distances required by the claims" is an improper refusal to interpret the claimed seat position as required by PTO policy and a failure to properly determine the scope and contents of the prior art. Christensen et al. disclose nothing about a horizontal distance between a first seat position and the shaft *k*.

As the combination of AAPA and Christensen et al. fails to include all the claim limitations, the combination fails to present a *prima facie* case of obviousness against claim 26.

There is also no suggestion or motivation found in either AAPA, Christensen et al., or the knowledge generally available to one of ordinary skill in the art, to combine the teachings of AAPA and Christensen et al. The examiner's determination on page 4, paragraph number 11, that Christensen et al. disclose a steering position disposed forward of the forward-most drive axle "in order to help provide a stable steering system" is a failure to properly determine the scope and contents of the prior art and a failure to resolve the level of ordinary skill in the art. Christensen et al. disclose no such thing. The position of the steering handle 10 is incidentally illustrated by Christensen et al. as arguably forward of the shaft *k*, but Christensen et al. clearly state that their invention is a pair of outboard steering shafts extending slantingly forward and downward such that the downward projection of their lower ends banks the snowmobile into a turn. The steering handle 10 is disclosed as connected to the two outboard steering shafts 11, 12 through a "conventional linkage." These disclosures would not have suggested to one of ordinary skill in the art that the position of the steering handle 10 with respect to the shaft *k* "helps to provide a stable steering system" as alleged by the examiner.

As there is no motivation or suggestion to combine AAPA and Christensen et al., the combination fails to produce a *prima facie* case of obviousness against claim 26.

Claim 26 is not anticipated or rendered obvious by Christensen et al. as there is no disclosure or suggestion of a horizontal distance between a first seat position and the forward-most drive track axle less than 590 mm and a steering position disposed forward of the forward-most drive track axle.

Claim 27 recites that the second seat position is disposed behind the first seat position by between 325 mm and 355 mm. Claim 28 recites that the second seat position is disposed behind the first seat position by between 335 mm and 345 mm. Claim 29 recites that the second seat position is disposed behind the first seat position by about 340 mm.

With respect to each of claims 27-29, although Figure 8 discloses that the the second seat position of the conventional snowmobile 110 is disposed behind the first seat position by 340 mm (between 325 mm and 355 mm and between 335 mm and 345 mm), the disclosure is insufficient to cure the deficiencies of the combination of AAPA and Christensen et al. discussed above and the combination fails to present a *prima facie* case of obviousness against each of claims 27-29.

Claim 30 recites that the second seat position is disposed behind the first seat position by between 275 mm and 305 mm. Claim 31 recites that the distance between 285 mm and 295 mm. Claim 32 recites that the distance is about 290 mm.

As shown in Figure 8, the second seat position of the conventional snowmobile 110 of Figure 1 is disposed 340 mm (distance F) behind the first seat position for both a long frame conventional snowmobile and a short frame conventional snowmobile. 340 mm is not between 275 mm and 305 mm, nor is it between 285 mm and 295 mm, nor is it about 290

mm. The examiner's determination on page 4, paragraph number 9, that AAPA discloses the second seat position is disposed behind the first seat position by about 290 mm is an improper refusal to follow PTO policy on claim interpretation and a failure to properly determine the scope and contents of the prior art.

Christensen et al. provide no disclosure, suggestion or motivation for a second seat position between 275 mm and 305 mm, between 285 mm and 295 mm, or about 290 mm behind a first seat position. Christensen et al. merely disclose a driver's seat. The combination of AAPA and Christensen et al. thus fails to present a *prima facie* case of obviousness against each of claims 30-32.

With respect to claim 37, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed behind the forward-most drive track axle between 550 mm and 580 mm.

With respect to claim 38, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed behind the forward-most drive track axle between 560 mm and 570 mm.

With respect to claim 39, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed behind the forward-most drive track axle about 565 mm.

It is respectfully submitted that each of the rejections of claims 37-39 fails to present a *prima facie* case of obviousness and are the result of an improper refusal of the examiner to interpret the claim as required by MPEP § 2111 and to apply PTO policy in the consideration and determination of obviousness as required by MPEP § 2141.

Claim 40 recites that the snowmobile further comprises a third seat position, wherein the third seat position is disposed behind the second seat position by between 285 mm and 370 mm.

The Office Action on page 4, paragraph number 9, alleges that AAPA discloses a snowmobile having first, second and third seat positions.

Page 2, paragraph [0066] of the instant application discloses that while it would be desirable to add a third seat to accommodate a second passenger (third rider), it has not been done because the riders are positioned so far back on the conventional snowmobile 110 that a third rider would experience prohibitively large jostling forces. Appellants have never admitted that the conventional snowmobile 110, disclosed and discussed throughout the instant application, includes a third seat position. The examiner's determination that AAPA discloses a third seat position is, once again, a failure on the part of the examiner to properly interpret the claim language in accordance with Patent Office policy as set forth in MPEP § 2111 and a failure to properly determine the scope and contents of the prior art as required by MPEP § 2141.

Christensen et al. do not disclose or suggest a third seat position on the snowmobile, and also fail to disclose or suggest a third seat position disposed behind a second seat position by between 285 mm and 370 mm. The combination of AAPA and Christensen et al., therefore, fails to establish a *prima facie* case of obviousness against claim 40.

With respect to claim 41, neither AAPA nor Christensen et al. disclose or suggest a third seat position disposed behind a second seat position by between 295 mm and 325 mm.

With respect to claim 42, neither AAPA nor Christensen et al. disclose or suggest a third seat position disposed behind a second seat position by between 305 mm and 315 mm.

With respect to claim 43, neither AAPA nor Christensen et al. disclose or suggest a third seat position disposed behind a second seat position by about 310 mm.

With respect to claim 44, neither AAPA nor Christensen et al. disclose or suggest a third seat position disposed behind a second seat position by between 330 mm and 360 mm.

With respect to claim 45, neither AAPA nor Christensen et al. disclose or suggest a third seat position disposed behind a second seat position by between 340 mm and 350 mm.

With respect to claim 46, neither AAPA nor Christensen et al. disclose or suggest a third seat position disposed behind a second seat position by about 345 mm.

The combination of AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against each of claims 41-46.

Claim 47 recites that the first and second seat positions are disposed on a singular seat unit. Although Figure 1 discloses the first and second seat positions 152, 154 of the conventional snowmobile 110 are disposed on a singular seat unit, the disclosure is insufficient to cure the deficiencies of the combination of AAPA and Christensen et al. discussed above and the combination fails to present a *prima facie* case of obviousness against claim 47.

Claim 50 recites that the first, second and third seat positions are disposed on a singular seat unit. As neither AAPA nor Christensen et al. disclose or suggest a third seat position, or a first, second, and third seat position disposed on a singular seat unit, the combination fails to present a *prima facie* case of obviousness against claim 50.

Claim 110 depends from claim 26 and recites that the snowmobile further includes a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

One of ordinary skill in the art would not have been motivated by Christensen et al. to modify the conventional snowmobile 110 as such a modification would result in change in the principle of operation of the snowmobile 110. One of ordinary skill in the art would not have been motivated by AAPA to modify the snowmobile *a* of Christensen et al. as such a modification would render the snowmobile *a* unsatisfactory for its intended purpose, or inoperable. The combination of AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against claim 110.

6. Claims 52-65, 67-75, 111 and 112 Are Not Obvious Over AAPA in View of Christensen et al.

Claim 52 recites a snowmobile including a frame including a tunnel, an engine disposed on the frame, a drive track disposed below the tunnel and connected operatively to the engine for propulsion of the snowmobile, a forward-most drive track axle disposed on the frame; two skis disposed on the frame, a steering device disposed on the frame and operatively connected to the two skis for steering the snowmobile, the steering device having a steering position, a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile; and a straddle-type seat disposed on the frame, wherein a back end of the seat extends behind a rearward-most portion of the frame and the steering position is disposed forward of the forward-most drive track axle.

Neither AAPA nor Christensen et al. disclose or suggest a steering position disposed forward of a forward-most drive track axle as recited in claim 52. Accordingly, the

combination of AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against claim 52.

Referring to Figure 8, the distance M, the distance that the back of the frame is spaced from the back of the seat, for embodiments 1 and 3-5 of the present invention, is a positive distance. As also clearly shown in Figure 8, the distance M for a conventional long frame snowmobile is -50 mm, meaning that the back end of the seat is in front of, not behind, a rearward-most portion of the frame. As also clearly shown in Figure 8, the distance M for a short frame conventional snowmobile is 0 mm, meaning that back end of the seat does not extend behind a rearward-most portion of the frame.

Christensen et al. do not disclose or suggest a back end of the driver's seat *d* extending behind a rearward-most portion of the structure *b*. As the combination of AAPA and Christensen fails to include all the claim limitations, the combination fails to present a *prima facie* case of obviousness against claim 52.

Christensen et al. can not anticipate or render obvious claim 52 because there is no disclosure or suggestion of a straddle-type seat having a back end that extends behind a rearward-most portion of the frame or a steering position disposed forward of the forward-most drive track axle.

Claim 53 recites that the back end of the seat extends behind the rearward-most portion of the frame by between 205 mm and 255 mm (the distance M); claim 54 recites that the distance is between 215 mm and 245 mm; claim 55 recites that the distance is between 225 mm and 235 mm; claim 56 recites that the distance is about 230 mm; claim 57 recites that the distance is between 35 mm and 85 mm; claim 58 recites that the distance is between 45 mm and 75 mm; claim 59 recites that the distance is between 55 mm and 65 mm; claim 60 recites that the distance is about 60 mm; claim 61 recites that the distance is between 265 mm

and 315 mm; claim 62 recites that the distance is between 275 mm and 305 mm; claim 63 recites that the distance is between 285 mm and 295 mm; and claim 64 recites that the distance is about 290 mm.

The Office Action on page 6, lines 2-7 alleges that AAPA discloses a back end of a snowmobile seat 23 extending behind the frame by about 80 mm, 230 mm, 60 mm or 290 mm and that the “measured distances in Figure 8 for the conventional snowmobile can meet the distances required by the claims since the distance from the back end of the seat extending behind the frame is about the same as the distance I.”

As clearly shown in Figure 8, the distance M for a conventional long frame snowmobile is -50 mm and 0 mm for a short frame conventional snowmobile. -50 mm and 0 mm are not between 205 mm and 255 mm are not between 215 mm and 245 mm; are not between 225 mm and 235 mm; are not about 230 mm; are not between 35 mm and 85 mm; are not between 45 mm and 75 mm; are not between 55 mm and 65 mm; are not about 60 mm; are not between 265 mm and 315 mm; are not between 275 mm and 305 mm; are not between 285 mm and 295 mm; and are not about 290 mm. The combination of AAPA and Christensen et al. thus fails to present a *prima facie* case of obviousness against each of claims 53-64.

With respect to the allegation that the “measured distances in Figure 8 for the conventional snowmobile can meet the distances required by the claims since the distance from the back end of the seat extending behind the frame is about the same as the distance I,” it is respectfully submitted that the measured distances in Figure 8 can not meet the claimed distances. It is also respectfully submitted that the examiner’s determination is also a failure to properly determine the scope and contents of the prior art as required by MPEP § 2141.



Claim 65 recites a support member attached to the frame that extends upwardly and rearwardly from the frame to provide structural support for the seat behind the back end of the frame.

It is respectfully submitted that that the conventional snowmobile 110 shown in Figure 1 of the instant application does not include a support member attached to the frame that extends upwardly and rearwardly from the frame to provide structural support for the seat behind the back end of the frame as the conventional snowmobile 110 does not include a back end of the seat extending behind a rearward-most portion of the frame, as discussed above with respect to claim 52. As Christensen et al. fail to cure this deficiency, the combination of AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against claim 65.

Claim 111 depends from claim 52 and recites that the snowmobile further includes a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

There is no suggestion or motivation in Christensen et al. to modify the conventional snowmobile 110 of Figure 1. The conventional snowmobile 110 of Figure 1 and the snowmobile *a* of Christensen et al. operate in fundamentally different ways and any modification of the conventional snowmobile 110 by the teachings of Christensen et al. would require a change in the principle of its operation.

There is also no suggestion or motivation in AAPA to modify the snowmobile *a* of Christensen et al. Any such modification would render Christensen et al.'s snowmobile *a* unsatisfactory for its intended purpose, or inoperable.

The combination of AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against claim 111.

Claim 67 recites a snowmobile including a frame having a tunnel, an engine disposed on the frame; a drive track; a forward-most drive track axle disposed on the frame; two skis disposed on the frame; a steering device disposed on the frame and operatively connected to the two skis for steering the snowmobile, the steering device having a steering position; a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile; a straddle-type seat, and a seat position disposed on the seat, wherein the seat position is disposed behind a rearward-most portion of the frame and the steering position is disposed forward of the forward-most drive track axle.

Neither AAPA or Christensen et al. disclose or suggest a steering position disposed forward of a forward-most drive track axle and the combination fails to establish a *prima facie* case of obviousness against claim 67.

Claim 67 is not anticipated or rendered obvious by Christensen et al. as there is no disclosure or suggestion of a seat position disposed behind a rearward-most portion of the frame and a steering position disposed forward of the forward-most drive track axle.

As clearly shown in Figure 8, the distance N for the third and fifth embodiments of the present invention is 80 mm and 60 mm, respectively. As also clearly shown in Figure 8, the distance N for a long frame conventional snowmobile and short frame conventional snowmobile are -290 mm and -120 mm, respectively, meaning that the rear seat position is disposed forward, not behind, a rearward-most portion of the frame. Accordingly, AAPA does not disclose or suggest a seat position disposed behind a rearward-most portion of the frame. As Christensen et al. also fail to disclose or suggest this feature, the combination of

AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against claim 67.

Claim 68 recites that the seat position is disposed behind the rearward-most portion of the frame by between 35 mm and 85 mm (the distance N); claim 69 recites that the distance is between 45 mm and 75 mm; claim 70 recites that the distance is between 55 mm and 65 mm; claim 71 recites that the distance is about 60 mm; claim 72 recites that the distance is between 55 mm and 105 mm; claim 73 recites that the distance is between 65 mm and 95 mm; claim 74 recites that the distance is between 75 mm and 85 mm; and claim 75 recites that the distance is about 80 mm.

As clearly shown in Figure 8, the distance N for a long frame conventional snowmobile is -290 mm and -120 mm for a short frame conventional snowmobile. -290 mm and -120 mm are not between 35 mm and 85 mm; are not between 45 mm and 75 mm; are not between 55 mm and 65 mm; are not about 60 mm; are not between 55 mm and 105 mm; are not between 65 mm and 95 mm; are not between 75 mm and 85 mm; and are not about 80 mm. The combination of AAPA and Christensen et al. fails to present a *prima facie* case of obviousness against each of claims 68-75.

Claim 112 depends from claim 67 and recites that the snowmobile further includes a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

One of ordinary skill would not have been motivated by Christensen et al. to modify the conventional snowmobile 110 so as to change its principle of operation, nor would one of ordinary skill in the art have been motivated by AAPA to modify the snowmobile *a* of Christensen et al. so as to render it unsatisfactory for its intended purpose, or inoperable. The

combination of AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against claim 112.

7. Claims 92-95 and 115 Are Not Obvious Over AAPA in View of Christensen et al.

Claim 92 recites a snowmobile including a frame; a straddle-type seat disposed on the frame; a seat position defined by the seat; an engine disposed on the frame in front of the seat; a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile; a forward-most drive track axle disposed on the frame; two skis disposed on the frame; a steering device having a steering position; and a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the seat position is disposed less than 590 mm behind the forward-most drive track axle and the steering position is disposed forward of the forward-most drive track axle.

Neither AAPA nor Christensen et al. disclose or suggest a steering position disposed forward of a forward-most drive track axle.

Neither AAPA nor Yoshioka et al. disclose or suggest a seat position less than 590 mm behind the forward-most drive track axle. The examiner's determination on page 7, paragraph number 21, that the "measured distances in Figure 8 for the conventional snowmobile can meet the distances required by the claims" is an improper refusal to follow PTO policy on claim interpretation as required by MPEP § 2111 and a failure to determine the scope and contents of the prior art as required by MPEP § 2141. As the combination fails to include all the claim limitations, and as there is no suggestion or motivation to combine the reference teachings, the combination fails to present a *prima facie* case of obviousness against claim 92.

The allegation on page 8, paragraph number 23, that Christensen et al. disclose a snowmobile having a steering position disposed forward of the forward-most drive axle “in order to help provide a stable steering system” is incorrect. Christensen et al. disclose nothing about the position of the steering handle 10 with respect to the shaft *k* having any effect on the stable steering system. Christensen et al. summarize their invention as a stable steering system provided by two, outboard steering shafts.

Claim 92 is not anticipated or rendered obvious by Christensen et al. as there is no disclosure or suggestion of a seat position disposed less than about 590 mm behind the forward-most drive track axle and a steering position disposed forward of the forward-most drive track axle.

Claim 93 recites that the seat position is disposed between 550 mm and 580 mm behind the forward-most drive track axle. As shown in Figure 8, the distance that the seat position is disposed behind the forward-most drive track axle is represented by the distance D plus the distance A and is 565 mm for all 6 embodiments of the present invention. Claim 94 recites that the distance is between 560 mm and 570 mm. Claim 95 recites that the distance is about 565 mm.

As also clearly shown in Figure 8, the distance that the seat position is disposed behind the forward-most drive track axle is 905 mm ( $795 + 110$  for a long frame conventional snowmobile and  $875 + 30$  for a short frame conventional snowmobile). 905 mm is not between 550 mm and 580 mm, is not between 560 mm and 570 mm, and is not about 565 mm. The combination of AAPA and Christensen et al. thus fails to present a *prima facie* case against each of claims 93-95.

Claim 115 depends from claim 92 and recites that the snowmobile further includes a front suspension system operatively connecting the two skis to the frame, wherein the front

suspension system is one of an A-arm suspension system and a trailing arm suspension system.

One of ordinary skill would not have been motivated by Christensen et al. to modify the conventional snowmobile 110. One of ordinary skill in the art also would not have been motivated by AAPA to modify the snowmobile a of Christensen et al. The respective snowmobiles operate in fundamentally different ways and any such modification would result in a change in the principle of operation of the snowmobiles, render the snowmobiles unsatisfactory for their intended purposes, or inoperable.

8. Claims 100-103 and 116 Are Not Obvious in View of AAPA in View of Christensen et al.

Claim 100 recites a snowmobile including a frame; a straddle-type seat disposed on the frame; a seat position defined by the seat; an engine disposed on the frame in front of the seat; a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile; a forward-most drive track axle disposed on the frame; two skis disposed on the frame; a steering device having a steering position; and a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the seat position is disposed less than 590 mm behind the forward-most drive track axle, the steering position is disposed forward of the forward-most drive track axle and the frame is between about 1493 mm and 1913 mm long.

AAPA does not disclose or suggest a seat position disposed less than 590 mm behind the forward-most drive track axle. The allegation on page 9, paragraph number 27 that AAPA discloses this feature is an improper refusal by the examiner to interpret the claim as required by PTO policy set forth in MPEP § 2111 and a failure to properly determine the scope and contents of the prior art as required by MPEP § 2141. Christensen et al. also fail to

disclose or suggest this feature and the combination of AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against claim 100.

The allegation on page 9, paragraph number 29, that Christensen et al. disclose a snowmobile having a steering position disposed forward of the forward-most drive axle “in order to help provide a stable steering system” is incorrect. The examiner’s determination on page 9, paragraph number 30 that it would have been obvious to provide the steering position of the conventional snowmobile 110 forward of the forward-most drive track axle is also incorrect. It is also a failure to properly determine the scope and content of the prior art and a failure to resolve the level of skill in the art. Christensen et al. disclose nothing about the position of the steering handle 10 with respect to the shaft *k* having any effect on the stable steering system. One of ordinary skill in the art would not have been motivated by Christensen et al. to modify the position of the steering position 134 of the conventional snowmobile 110 in any way.

Christensen et al. can not anticipate or render obvious claim 100 because there is no disclosure or suggestion of seat position is disposed less than 590 mm behind the forward-most drive track axle and a steering position is disposed forward of the forward-most drive track axle.

Claim 101 recites that the seat position is disposed between 550 mm and 580 mm behind the forward-most drive track axle. As shown in Figure 8, the distance that the seat position is disposed behind the forward-most drive track axle is represented by the distance D plus the distance A and is 565 mm for all 6 embodiments of the present invention. Claim 102 recites that the distance is between 560 mm and 570 mm. Claim 103 recites that the distance is about 565 mm.

As also clearly shown in Figure 8, the distance that the seat position is disposed behind the forward-most drive track axle is 905 mm (795 + 110 for a long frame conventional snowmobile and 875 + 30 for a short frame conventional snowmobile). 905 mm is not between 550 mm and 580 mm, is not between 560 mm and 570 mm, and is not about 565 mm. The combination of AAPA and Christensen et al. thus fails to present a *prima facie* case against each of claims 101-103.

Claim 116 depends from claim 100 and recites that the snowmobile further includes a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

One of ordinary skill would not have been motivated by Christensen et al. to modify the conventional snowmobile 110 so as to change its principle of operation, nor would one of ordinary skill in the art have been motivated by AAPA to modify the snowmobile *a* of Christensen et al. so as to render it unsatisfactory for its intended purpose, or inoperable. The combination of AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against claim 116.

9. Claims 104 and 117 Are Not Obvious Over AAPA in View of Christensen et al.

Claim 104 recites a snowmobile a frame; a straddle-type seat disposed on the frame; a seat position defined by the seat; an engine disposed on the frame in front of the seat; a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile; a forward-most drive track axle disposed on the frame; two skis disposed on the frame; a steering device having a steering position; and a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the



steering position is disposed forward of the forward-most drive track axle and the frame is between about 1493 mm and 1913 mm long.

Neither AAPA nor Christensen et al. disclose or suggest a snowmobile having a steering position disposed forward of the forward-most drive track axle. The combination does not establish a *prima facie* case of obviousness against claim 104.

Page 10, paragraph number 34 and page 11, paragraph number 35 of the Office Action are clear failures to determine the scope and contents of the prior art and to resolve the level of ordinary skill in the art, respectively.

Claim 104 is not anticipated or rendered obvious by Christensen et al. as there is no disclosure or suggestion of a steering position disposed forward of the forward-most drive track axle, nor is there any disclosure or suggestion of a frame between 1493 and 1913 mm long.

Claim 117 depends from claim 100 and recites that the snowmobile further includes a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

There is no suggestion or motivation in Christensen et al. to modify the conventional snowmobile 110 of Figure 1. The conventional snowmobile 110 of Figure 1 and the snowmobile *a* of Christensen et al. operate in fundamentally different ways and any modification of the conventional snowmobile 110 by the teachings of Christensen et al. would require a change in the principle of its operation.

There is also no suggestion or motivation in AAPA to modify the snowmobile *a* of Christensen et al. Any such modification would render Christensen et al.'s snowmobile *a* unsatisfactory for its intended purpose, or inoperable.

The combination of AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against claim 117.

10. Claims 22, 23 and 25 Are Not Obvious Over AAPA in View of Christensen et al. and Atherley '380

Claim 22 depends from 1 and recites that the seat comprises first and second seat sections, the second section being removable, the first seat position being on the first seat section, and the second seat position being on the second seat section.

The Office Action on page 11, paragraph number 38 alleges that Atherley '380 discloses a seat having first and second seat sections 106 and 104 with a cargo space 44 beneath the second seat section, wherein the second seat section is removable in order to provide seat exchangeability.

What Atherley '380 actually discloses is a seat 100 having a base section 102 and a seat section 104 that is removably disposed on the base section 102 with hook and loop type fasteners to provide riders with choice of a seat section 104 with an appropriate flexibility. Atherley '380 does not disclose or suggest a seat having first and second seat sections with first and second seat positions, the first seat position being on the first seat section and the second seat position being on the second seat section, as recited in claim 22. As Atherley '380 does not disclose or suggest this claim limitation, the combination of AAPA, Christensen et al. and Atherley '380 fails to present a *prima facie* case of obviousness against claim 22.

Claims 23 depends from claim 22 and recites that a cargo space is provided behind the first seat section beneath the second removable seat section.

The cargo space of the seat disclosed by Atherley '380 is not behind a first seat section and beneath a second removable seat section because Atherley '380 does not disclose or suggest a seat including first and second seat sections with first and second seat positions, the first seat position being on the first seat section and the second seat position being on the second seat section. Accordingly, the combination of AAPA, Christensen et al. and Atherley '380 fails to present a *prima facie* case of obviousness against claim 23.

Claim 25 depends from claim 14 and recites that the seat comprises first and second seat sections, the second seat section being removable, the first and second positions being on the first seat section, and the third seat position being on the second seat section.

Atherley '380 does not disclose or suggest a seat having first and second seat sections, the first and second seat positions being on the first section and the third seat position being on the second seat section. Atherley '380 merely discloses a seat having a single seat position with an exchangeable section 104 to provide a varying degree flexibility for riders of various weight.

As the combination of AAPA, Christensen et al. and Atherley '380 fails to include all of the limitations of claim 25, the combination fails to present a *prima facie* case of obviousness against claim 25.

11. Claims 48, 49, 51, 66 and 76 Are Not Obvious Over AAPA in View of Christensen et al. and Atherley '380

Claim 48 depends from 26 and recites that the seat comprises first and second seat sections, the second section being removable, the first seat position being on the first seat section, and the second seat position being on the second seat section.

The Office Action on page 12, paragraph number 40 alleges that Atherley '380 discloses a seat having first and second seat sections 106 and 104 with a cargo space 44 beneath the second seat section, wherein the second seat section is removable in order to provide seat exchangeability.

It is respectfully submitted that Atherley '380 does not disclose or suggest any such structure. As Atherley '380 does not disclose or suggest this claim limitation, the combination of AAPA, Christensen et al. and Atherley '380 fails to present a *prima facie* case of obviousness against claim 22.

Claims 49 depends from claim 48 and recites that a cargo space is provided behind the first seat section beneath the second removable seat section.

The cargo space of the seat disclosed by Atherley '380 is not behind a first seat section and beneath a second removable seat section because Atherley '380 does not disclose or suggest a seat including first and second seat sections with first and second seat positions, the first seat position being on the first seat section and the second seat position being on the second seat section. Accordingly, the combination of AAPA, Christensen et al. and Atherley '380 fails to present a *prima facie* case of obviousness against claim 49.

Claim 51 depends from claim 40 and recites that the seat comprises first and second seat sections, the second seat section being removable, the first and second positions being on the first seat section, and the third seat position being on the second seat section.

Atherley '380 does not disclose or suggest a seat having first and second seat sections, the first and second seat positions being on the first section and the third seat position being on the second seat section. Atherley '380 merely discloses a seat having a single seat position with an exchangeable section 104 to provide a varying degree flexibility for riders of various weight.

As the combination of AAPA, Christensen et al. and Atherley '380 fails to include all of the limitations of claim 51, the combination fails to present a *prima facie* case of obviousness against claim 51.

Claim 66 recites that the seat comprises first and second seat sections, the second seat section being removable.

Claim 76 recites that the seat comprises first and second sections, the second seat section being behind a first seat section, the second seat section being removable, and the seat position being on the second seat section.

The Office Action on page 12, paragraph number 40 states that the modified AAPA's snowmobile discloses all of Applicants' claimed invention except for a second seat section that is removable. As discussed in great detail above, the AAPA's snowmobile discloses none of Applicants' claimed invention and there is no motivation or suggestion to combine Christensen et al. In addition, Atherley '380 merely discloses a seat having a removable section, but does not disclose or suggest a back end of the seat extending behind a rearward-most portion of the frame (note claim 52 from which claim 66 depends), nor does Atherley

'380 disclose that the second seat section is behind the first seat section, the second seat section being removable, and the seat position being on the second seat section, as recited in claim 76. As the combination of AAPA, Christensen et al. and Atherley '380 does not disclose or suggest all of the claim limitations, the combination fails to present a *prima facie* case of obviousness against each of claims 66 and 76.

12. Claims 118 and 122-130 Are Not Obvious Over AAPA in View of Christensen et al.

Claim 118 recites a snowmobile including a frame; a straddle-type seat disposed on the frame; an engine disposed on the frame in front of the seat; a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile; a forward-most drive track axle disposed on the frame; two skis disposed on the frame; a steering device having a steering position; and a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the steering position is disposed forward of the forward-most drive track axle.

Neither AAPA nor Christensen et al. disclose or suggest a snowmobile including a steering device having a steering position disposed forward of a forward-most drive track axle, as recited in claim 118. The combination fails to present a *prima facie* case of obviousness against claim 118.

Christensen et al. can not anticipate or render obvious claim 118 as there is no disclosure or suggestion of a steering position disposed forward of the forward-most drive track axle.

Claim 122 recites that the steering shaft angle  $\epsilon$  is disposed over the engine at an angle  $\epsilon$  less than 45° from vertical. Claim 123 recites that the angle  $\epsilon$  is between 25° and 40°

from vertical. Claim 124 recites that the angle  $\epsilon$  is between 30° and 35°. Claim 125 recites that the angle  $\epsilon$  is 33° from vertical.

Neither AAPA nor Christensen et al. disclose or suggest this feature. As discussed above, the angle  $\epsilon$  of AAPA as shown in Figure 8 is greater than or equal to 45°. The two outboard steering shafts 11, 12 of Christensen et al. are disposed at approximately 25° more or less to vertical, but, being outboard of the engine, are not disposed over the engine. There is also no disclosure or suggestion by Christensen et al. that varying the angle  $t$  would achieve any result, let alone the result recognized by the present invention. Christensen et al. disclose nothing about the angle of the unlabelled shaft extending from the steering handle 10. As the combination of AAPA and Christensen et al. fails to include all the claim limitations, the combination fails to present a *prima facie* case of obviousness against each of claims 122-125.

With respect to claim 126, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed less than 590 mm behind the forward-most drive track axle.

With respect to claim 127, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed behind the forward-most drive track axle between 550 mm and 580 mm.

With respect to claim 128, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed behind the forward-most drive track axle between 560 mm and 570 mm.

With respect to claim 129, neither AAPA nor Christensen et al. disclose or suggest a first seat position disposed behind the forward-most drive track axle by about 565 mm.

It is respectfully submitted that each of the rejections of claims 126-129 fails to present a *prima facie* case of obviousness and are the result of an improper refusal of the examiner to interpret the claim as required by MPEP § 2111 and to apply PTO policy in the consideration and determination of obviousness as required by MPEP § 2141.

Claim 130 depends from claim 118 and recites that the snowmobile further includes a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

There is no suggestion or motivation in Christensen et al. to modify the conventional snowmobile 110 of Figure 1. The conventional snowmobile 110 of Figure 1 and the snowmobile *a* of Christensen et al. operate in fundamentally different ways and any modification of the conventional snowmobile 110 by the teachings of Christensen et al. would require a change in the principle of its operation. The combination of AAPA and Christensen et al. fails to establish a *prima facie* case of obviousness against claim 130



VI. CONCLUSION

For at least the reasons discussed above, it is respectfully submitted that claims 1-21, 24, 26-32, 3747, 50, 52-65, 67-75 and 77-87, 92-95, 100-104, 109-118 and 122-130 are not obvious over of AAPA in view Christensen et al. and claims 22, 23, 25, 48, 49, 51, 66 and 76 are not obvious over AAPA in view of Christensen et al. and Atherley '380.

For the above reasons, Appellants respectfully request this Honorable Board to reverse the rejection of the claims.

Respectfully submitted,

PILLSBURY WINTHROP LLP

A handwritten signature in black ink, reading "John P. Darling". The signature is fluid and cursive, with the first name "John" and last name "Darling" clearly legible.

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VII. APPENDIX A

1. A snowmobile, comprising:

a frame;

a straddle-type seat disposed on the frame;

first and second seat positions defined by the seat;

an engine disposed on the frame in front of the seat;

a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile;

a forward-most drive track axle disposed on the frame;

two skis disposed on the frame;

a steering device having a steering position; and

a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the steering shaft is disposed over the engine at an angle  $\epsilon$  of less than  $45^\circ$  from vertical, the first seat position is disposed less than 590 mm behind the forward-most drive track axle, the second seat position is disposed behind the first seat position by between 265 mm and 365 mm, and the steering position is disposed forward of the forward-most drive track axle.

2. The snowmobile of claim 1, wherein angle  $\epsilon$  is between  $25^\circ$  and  $40^\circ$  from vertical.

3. The snowmobile of claim 2, wherein angle  $\epsilon$  is between  $30^\circ$  and  $35^\circ$  from vertical.

4. The snowmobile of claim 3, wherein angle  $\epsilon$  is  $33^\circ$  from vertical.

5. The snowmobile of claim 1, wherein the first seat position is disposed between 550 mm and 580 mm behind the forward-most drive track axle.

6. The snowmobile of claim 5, wherein the first seat position is disposed between 560 mm and 570 mm behind the forward-most drive track axle.
7. The snowmobile of claim 6, wherein the first seat position is disposed about 565 mm behind the forward-most drive track axle.
8. The snowmobile of claim 1, wherein the second seat position is disposed behind the first seat position by between 325 mm and 355 mm.
9. The snowmobile of claim 8, wherein the second seat position is disposed behind the first seat position by between 335 mm and 345 mm.
10. The snowmobile of claim 9, wherein the second seat position is disposed behind the first seat position by about 340 mm.
11. The snowmobile of claim 1, wherein the second seat position is disposed behind the first seat position by between 275 mm and 305 mm.
12. The snowmobile of claim 11, wherein the second seat position is disposed behind the first seat position by between 285 mm and 295 mm.
13. The snowmobile of claim 12, wherein the second seat position is disposed behind the first seat position by about 290 mm.
14. The snowmobile of claim 1 further comprising a third seat position on the seat, wherein the third seat position is disposed behind the second seat position by between 285 mm and 370 mm.
15. The snowmobile of claim 14, wherein the third seat position is disposed behind the second seat position by between 295 mm and 325 mm.
16. The snowmobile of claim 15, wherein the third seat position is disposed behind the second seat position by between 305 and 315 mm.

17. The snowmobile of claim 16, wherein the third seat position is disposed behind the second seat position by about 310 mm.
18. The snowmobile of claim 14, wherein the third seat position is disposed behind the second seat position by between 330 mm and 360 mm.
19. The snowmobile of claim 18, wherein the third seat position is disposed behind the second seat position by between 340 mm and 350 mm.
20. The snowmobile of claim 19, wherein the third seat position is disposed behind the second seat position by about 345 mm.
21. The snowmobile of claim 1, wherein the first and second seat positions are disposed on a singular seat unit.
22. The snowmobile of claim 1, wherein the seat comprises first and second seat sections, the second seat section being removable, the first seat position being on the first seat section, and the second seat position being on the second seat section.
23. The snowmobile of claim 22, wherein a cargo space is provided behind the first seat section beneath the second removable seat section.
24. The snowmobile of claim 14, wherein the first, second, and third seat positions are disposed on a singular seat unit.
25. The snowmobile of claim 14, wherein the seat comprises first and second seat sections, the second seat section being removable, the first and second seat positions being on the first seat section, and the third seat position being on the second seat section.
26. A snowmobile, comprising:
  - a frame;
  - a straddle-type seat disposed on the frame;

first and second seat positions defined by the seat;

an engine disposed on the frame in front of the seat;

a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile;

a forward-most drive track axle disposed on the frame;

a steering device having a steering position;

two skis disposed on the frame and operatively connected to the steering device; and

a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the steering position is disposed forward of the forward-most drive track axle, a horizontal distance between the forward-most drive track axle and the first seat position is less than 590 mm, and the second seat position is disposed behind the first seat position by between 265 mm and 365 mm.

27. The snowmobile of claim 26, wherein the second seat position is disposed behind the first seat position by between 325 mm and 355 mm.

28. The snowmobile of claim 27, wherein the second seat position is disposed behind the first seat position by between 335 mm and 345 mm.

29. The snowmobile of claim 28, wherein the second seat position is disposed behind the first seat position by about 340 mm.

30. The snowmobile of claim 26, wherein the second seat position is disposed behind the first seat position by between 275 mm and 305 mm.

31. The snowmobile of claim 30, wherein the second seat position is disposed behind the first seat position by between 285 mm and 295 mm.

32. The snowmobile of claim 31, wherein the second seat position is disposed behind the first seat position by about 290 mm.
37. The snowmobile of claim 26, wherein the horizontal distance between the forward-most drive track axle and the first seat position is between 550 mm and 580 mm.
38. The snowmobile of claim 37, wherein the horizontal distance between the forward-most drive track axle and the first seat position is between 560 mm and 570 mm.
39. The snowmobile of claim 38, wherein the horizontal distance between the forward-most drive track axle and the first seat position is about 565 mm.
40. The snowmobile of claim 26, further comprising a third seat position on the seat, wherein the third seat position is disposed behind the second seat position by between 285 mm and 370 mm.
41. The snowmobile of claim 40, wherein the third seat position is disposed behind the second seat position by between 295 mm and 325 mm.
42. The snowmobile of claim 41, wherein the third seat position is disposed behind the second seat position by between 305 and 315 mm.
43. The snowmobile of claim 42, wherein the third seat position is disposed behind the second seat position by about 310 mm.
44. The snowmobile of claim 40, wherein the third seat position is disposed behind the second seat position by between 330 mm and 360 mm.
45. The snowmobile of claim 44, wherein the third seat position is disposed behind the second seat position by between 340 mm and 350 mm.
46. The snowmobile of claim 45, wherein the third seat position is disposed behind the second seat position by about 345 mm.

47. The snowmobile of claim 26, wherein the first and second seat positions are disposed on a singular seat unit.

48. The snowmobile of claim 26, wherein the seat comprises first and second seat sections, the second seat section being removable, the first seat position being on the first seat section, and the second seat position being on the second seat section.

49. The snowmobile of claim 48, wherein a cargo space is provided behind the first seat section beneath the second removable seat section.

50. The snowmobile of claim 40, wherein the first, second, and third seat positions are disposed on a singular seat unit.

51. The snowmobile of claim 40, wherein the seat comprises first and second seat sections, the second seat section being removable, the first and second seat positions being on the first seat section, and the third seat position being on the second seat section.

52. A snowmobile, comprising:

a frame including a tunnel;

an engine disposed on the frame;

a drive track disposed below the tunnel and connected operatively to the engine for propulsion of the snowmobile;

a forward-most drive track axle disposed on the frame;

two skis disposed on the frame;

a steering device disposed on the frame and operatively connected to the two skis for steering the snowmobile, the steering device having a steering position;

a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile; and

a straddle-type seat disposed on the frame, wherein a back end of the seat extends behind a rearward-most portion of the frame and the steering position is disposed forward of the forward-most drive track axle .

53. The snowmobile of claim 52, wherein the back end of the seat extends behind the rearward-most portion of the frame by between 205 mm and 255 mm.

54. The snowmobile of claim 53, wherein the back end of the seat extends behind the rearward-most portion of the frame by between 215 mm and 245 mm.

55. The snowmobile of claim 54, wherein the back end of the seat extends behind the rearward-most portion of the frame by between 225 mm and 235 mm.

56. The snowmobile of claim 55, wherein the back end of the seat extends behind the rearward-most portion of the frame by about 230 mm.

57. The snowmobile of claim 52, wherein the back end of the seat extends behind the rearward-most portion of the frame by between 35 mm and 85 mm.

58. The snowmobile of claim 57, wherein the back end of the seat extends behind the rearward-most portion of the frame by between 45 mm and 75 mm.

59. The snowmobile of claim 58, wherein the back end of the seat extends behind the rearward-most portion of the frame by between 55 mm and 65 mm.

60. The snowmobile of claim 59, wherein the back end of the seat extends behind the rearward-most portion of the frame by about 60 mm.

61. The snowmobile of claim 52, wherein the back end of the seat extends behind the rearward-most portion of the frame by between 265 mm and 315 mm.

62. The snowmobile of claim 61, wherein the back end of the seat extends behind the rearward-most portion of the frame by between 275 mm and 305 mm.



63. The snowmobile of claim 62, wherein the back end of the seat extends behind the rearward-most portion of the frame by between 285 mm and 295 mm.
64. The snowmobile of claim 63, wherein the back end of the seat extends behind the rearward-most portion of the frame by about 290 mm.
65. The snowmobile of claim 52, further comprising a support member attached to the frame that extends upwardly and rearwardly from the frame to provide structural support for the seat behind the back end of the frame.
66. The snowmobile of claim 65, wherein the seat comprises first and second seat sections, the second seat section being removable.
67. A snowmobile, comprising:
- a frame having a tunnel;
  - an engine disposed on the frame;
  - a drive track disposed below the tunnel and connected operatively to the engine for propulsion of the snowmobile;
  - a forward-most drive track axle disposed on the frame;
  - two skis disposed on the frame;
  - a steering device disposed on the frame and operatively connected to the two skis for steering the snowmobile, the steering device having a steering position;
  - a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile;
  - a straddle-type seat disposed on the frame behind the steering device; and

a seat position disposed on the seat, wherein the seat position is disposed behind a rearward-most portion of the frame and the steering position is disposed forward of the forward-most drive track axle.

68. The snowmobile of claim 67, wherein the seat position is disposed behind the rearward-most portion of the frame by between 35 and 85 mm.

69. The snowmobile of claim 68, wherein the seat position is disposed behind the rearward-most portion of the frame by between 45 and 75 mm.

70. The snowmobile of claim 69, wherein the seat position is disposed behind the rearward-most portion of the frame by between 55 and 65 mm.

71. The snowmobile of claim 70, wherein the seat position is disposed behind the rearward-most portion of the frame by about 60 mm.

72. The snowmobile of claim 67, wherein the seat position is disposed behind the rearward-most portion of the frame by between 55 mm and 105 mm.

73. The snowmobile of claim 72, wherein the seat position is disposed behind the rearward-most portion of the frame by between 65 and 95 mm.

74. The snowmobile of claim 73, wherein the seat position is disposed behind the rearward-most portion of the frame by between 75 and 85 mm.

75. The snowmobile of claim 74, wherein the seat position is disposed behind the rearward-most portion of the frame by about 80 mm.

76. The snowmobile of claim 67, wherein the seat comprises first and second seat sections, the second seat section being behind the first seat section, the second seat section being removable, and the seat position being on the second seat section.

77. A snowmobile, comprising:

a frame;

a straddle-type seat disposed on the frame;

a seat position defined by the seat;

an engine disposed on the frame in front of the seat;

a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile;

a forward-most drive track axle disposed on the frame;

two skis disposed on the frame;

a steering device having a steering position; and

a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the steering shaft is disposed over the engine at an angle  $\epsilon$  of less than  $45^\circ$  from vertical, the steering position is disposed forward of the forward-most drive track axle and the seat position is disposed less than 590 mm behind the forward-most drive track axle.

78. The snowmobile of claim 77, wherein the angle  $\epsilon$  is between  $25^\circ$  and  $40^\circ$  from vertical.

79. The snowmobile of claim 78, wherein the angle  $\epsilon$  is between  $30^\circ$  and  $35^\circ$  from vertical.

80. The snowmobile of claim 79, wherein the angle  $\epsilon$  is  $33^\circ$  from vertical.

81. The snowmobile of claim 77, wherein the seat position is disposed behind the forward-most drive track axle by between 550 mm and 580 mm.

82. The snowmobile of claim 81, wherein the seat position is disposed behind the forward-most drive track axle by between 560 mm and 570 mm.

83. The snowmobile of claim 82, wherein the seat position is disposed behind the forward-most drive track axle by about 565 mm.

84. A snowmobile, comprising:

a frame;

a straddle-type seat disposed on the frame;

a seat position defined by the seat;

an engine disposed on the frame in front of the seat;

a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile;

a forward-most drive track axle disposed on the frame;

two skis disposed on the frame;

a steering device having a steering position; and

a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the steering shaft is disposed over the engine at an angle  $\epsilon$  of less than 45° from vertical and the steering position is disposed forward of the forward-most drive track axle.

85. The snowmobile of claim 84, wherein the angle  $\epsilon$  is between 25° and 40° from vertical.

86. The snowmobile of claim 85, wherein the angle  $\epsilon$  is between 30° and 35° from vertical.

87. The snowmobile of claim 86, wherein the angle  $\epsilon$  is  $33^\circ$  from vertical.
92. A snowmobile, comprising:
- a frame;
  - a straddle-type seat disposed on the frame;
  - a seat position defined by the seat;
  - an engine disposed on the frame in front of the seat;
  - a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile;
  - a forward-most drive track axle disposed on the frame;
  - two skis disposed on the frame;
  - a steering device having a steering position; and
  - a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the seat position is disposed less than 590 mm behind the forward-most drive track axle and the steering position is disposed forward of the forward-most drive track axle.
93. The snowmobile of claim 92, wherein the seat position is disposed between 550 mm and 580 mm behind the forward-most drive track axle.
94. The snowmobile of claim 93, wherein the seat position is disposed between 560 mm and 570 mm behind the forward-most drive track axle.
95. The snowmobile of claim 94, wherein the seat position is disposed about 565 mm behind the forward-most drive track axle.
100. A snowmobile, comprising:
- a frame;

- a straddle-type seat disposed on the frame;
  - a seat position defined by the seat;
  - an engine disposed on the frame in front of the seat;
  - a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile;
  - a forward-most drive track axle disposed on the frame;
  - two skis disposed on the frame;
  - a steering device having a steering position; and
  - a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the seat position is disposed less than 590 mm behind the forward-most drive track axle, the steering position is disposed forward of the forward-most drive track axle and the frame is between about 1493 mm and 1913 mm long.
101. The snowmobile of claim 100, wherein the seat position is disposed between 550 mm and 580 mm behind the forward-most drive track axle.
102. The snowmobile of claim 101, wherein the seat position is disposed between 560 mm and 570 mm behind the forward-most drive track axle.
103. The snowmobile of claim 102, wherein the seat position is disposed about 565 mm behind the forward-most drive track axle.
104. A snowmobile, comprising:
- a frame;
  - a straddle-type seat disposed on the frame;
  - a seat position defined by the seat;
  - an engine disposed on the frame in front of the seat;

a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile;

a forward-most drive track axle disposed on the frame;

two skis disposed on the frame;

a steering device having a steering position; and

a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the steering position is disposed forward of the forward-most drive track axle and the frame is between about 1493 mm and 1913 mm long.

109. The snowmobile of claim 1, further comprising a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

110. The snowmobile of claim 26, further comprising a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

111. The snowmobile of claim 52, further comprising a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

112. The snowmobile of claim 67, further comprising a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

113. The snowmobile of claim 77, further comprising a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

114. The snowmobile of claim 84, further comprising a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

115. The snowmobile of claim 92, further comprising a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

116. The snowmobile of claim 100, further comprising:

a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

117. The snowmobile of claim 104, further comprising a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

118. A snowmobile, comprising:

a frame;

a straddle-type seat disposed on the frame;

an engine disposed on the frame in front of the seat;

a drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile;

a forward-most drive track axle disposed on the frame;

two skis disposed on the frame;

a steering device having a steering position; and



a steering shaft operatively connecting the two skis to the steering device for steering the snowmobile, wherein the steering position is disposed forward of the forward-most drive track axle.

122. The snowmobile of claim 118, wherein the steering shaft is disposed over the engine at an angle  $\epsilon$  of less than  $45^\circ$  from vertical.

123. The snowmobile of claim 122, wherein the angle  $\epsilon$  is between  $25^\circ$  and  $40^\circ$  from vertical.

124. The snowmobile of claim 123, wherein the angle  $\epsilon$  is between  $30^\circ$  and  $35^\circ$  from vertical.

125. (New) The snowmobile of claim 124, wherein the angle  $\epsilon$  is  $33^\circ$  from vertical.

126. The snowmobile of claim 118, further comprising a seat position defined by the seat, wherein the seat position is disposed less than 590 mm behind the forward-most drive track axle.

127. The snowmobile of claim 126, wherein seat position is disposed between 550 mm and 580 mm behind the forward-most drive track axle.

128. The snowmobile of claim 127, wherein the seat position is disposed between 560 mm and 570 mm behind the forward-most drive track axle.

129. The snowmobile of claim 128, wherein the seat position is disposed about 565 mm behind the forward-most drive track axle.

130. The snowmobile of claim 118, further comprising a front suspension system operatively connecting the two skis to the frame, wherein the front suspension system is one of an A-arm suspension system and a trailing arm suspension system.

## **APPENDIX B**

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**FULL TEXT OF CASES (USPQ FIRST SERIES)**  
In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980)

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In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980)

## **In re Boesch and Slaney**

**(CCPA)**  
**205 USPQ 215**

**Decided Mar. 13, 1980**

**No. 79-597**

**U.S. Court of Customs and Patent Appeals**

### **Headnotes**

#### **PATENTS**

##### **1. Patentability -- Invention -- In general (§ 51.501)**

##### **Patentability -- Invention -- Specific cases -- In general** (§ 51.5091)

Discovery of optimum value of result effective variable in known process is ordinarily within skill of art.

##### **2. Patentability -- Composition of matter (§ 51.30)**

##### **Patentability -- Evidence of -- In general** (§ 51.451)

##### **Patentability -- Evidence of -- Comparison with allowed claims or patents** (§ 51.457)

##### **Patentability -- Invention -- In general** (§ 51.501)

##### **Patentability -- Invention -- Specific cases -- In general** (§ 51.5091)

Prima facie case of obviousness may be rebutted where results of optimizing variable, which was known to be result effective, are unexpectedly good; proof of unexpected properties may be in form of direct or indirect comparative testing of claimed compounds and closest prior art.

##### **3. Patentability -- Composition of matter (§ 51.30)**

##### **Patentability -- Evidence of -- In general** (§ 51.451)

**Patentability -- Evidence of -- Comparison with allowed claims or patents (§ 51.457)**

**Patentability -- Invention -- Specific cases -- Chemical (§ 51.5093)**

Data that compares four examples of claimed alloys with one example of prior art alloy and is intended to show unexpected results are not commensurate in scope with claims for broad range of elements in case in which weight percent of elements in four examples of claimed alloys vary by relatively minor amounts, for example, entire claimed range of carbon is .18 percent, but tested range is only .02, and claimed cobalt range is 4.8, but test range is only 1.3, and there is no evidence showing whether other alloys encompassed by these broad claims and having elements varying by relatively major amounts also exhibit unexpected results.

**4. Patentability -- Composition of matter (§ 51.30)**

**Patentability -- Evidence of -- In general (§ 51.451)**

**Patentability -- Evidence of -- Comparison with allowed claims or patents (§ 51.457)**

**Patentability -- Invention -- Specific cases -- Chemical (§ 51.5093)**

Test results involving single alloy within broad range claimed are not sufficient to support appellants' allegation of what would, from prior art, be unexpected under circumstances in which essential concept of invention is to maintain average number of electron vacancies at value not exceeding about 2.35, prior art teaches that reduction of  $N_v$  value reduces the chances of sigma phase in alloy, appellants allege that alloys meeting their composition and  $N_v$  value requirements are free from sigma phase, and appellants tested only one example of low  $N_v$  value alloy and found no sigma, which is result consistent with both prior art

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teaching and appellants' allegation that their claimed alloys are totally free from sigma phase; where it is alleged that certain technique for flipping coins would always produce "heads," one would hardly be persuaded by single toss of coin that resulted in showing of "heads."

**Particular patents -- Nickel Alloys**

Boesch and Slaney, Temperature Nickel Based Alloy and Process of Making Same, rejection of claims 1 and 8-15 affirmed.

**Case History and Disposition:**

Appeal from Patent and Trademark Office Board of Appeals.

Application for patent of William J. Boesch and John S. Slaney, Serial No. 587,776, filed June 17, 1975. From decision rejecting claims 1 and 8-15, applicants appeal. Affirmed.

**Attorneys:**

Robert F. Dropkin and Vincent G. Gioia, both of Pittsburgh, Pa., for appellants.

Joseph F. Nakamura (John W. Dewhirst, of counsel) for Commissioner of Patents and Trademarks.

**Judge:**

Before Markey, Chief, Judge, Rich, Baldwin, and Miller, Associate, Judges, and Maletz, \*Judge.

**Opinion Text****Opinion By:**

Miller, Judge.

This is an appeal from a decision of the Patent and Trademark Office ("PTO") Board of Appeals ("board") which sustained the examiner's rejection under 35 USC 103 of appellants' claims <sup>1</sup>1 and 8-15 in view of Lamb <sup>2</sup>and Pohlman <sup>3</sup>et al. We affirm.

**Invention**

The invention embraces nickel base alloys consisting essentially of:

*Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

The remainder of the alloys comprises nickel and incidental impurities. The elements in the alloys are balanced to provide an  $N_v$  <sup>4</sup>value not in excess of about 2.35 <sup>5</sup>according to the following equation:

$$N_v = 4.66 (A\% \text{ Cr} + A\% \text{ Mo}) + 1.71 (A\% \text{ Co}) + 0.61 (A\% \text{ Ni}) \text{ } ^6$$

In the case of alloys within the board range set forth above, but not balanced to meet the required  $N_v$  value, room temperature ductility deteriorates, and creep <sup>7</sup>deformation increases, after prolonged exposure at elevated temperatures. Appellants state that these results are attributable to formation of a deleterious phase (known as "sigma phase") in the metal after such exposure, and that the tendency of an alloy to form sigma phase is (unexpectedly) eliminated by balancing the relative amounts of its constituent elements in accordance with the  $N_v$  equation. Where the composition of an alloy has been controlled to provide an  $N_v$  value of about 2.35 or less, no sigma has been found after exposure at 1500° F for time periods up to 7200 hours.

Claim 1 is illustrative:

1. A nickel base alloy having a composition consisting essentially of up to 0.18% carbon from about 14.2% to about 19.0% cobalt, from about 13.7% to about 15.3% chromium, from about 3.8% to about 4.8% molybdenum, from about 3.0% to about 3.7% titanium, from about 4.0% to about 4.7% aluminum, up to about 4.0% iron, from 0.005% to about 0.03% boron and the balance essentially nickel with incidental impurities, the aforementioned elements being balanced to provide an  $N_v$  value not in excess of about 2.35 according to the following equation:

$$N_v = 4.66 (A\% C + A\% Mo) + 1.71 (A\% Co) + 0.61 (A\% Ni)$$

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the alloy being characterized by its freedom from precipitation of deleterious amounts of sigma-like phase after exposure at temperatures in excess of 1500°F for periods of time in excess of 1000 hours.

### **Prior Art**

Lamb discloses a process for hot working age-hardenable nickel-chromium alloys. The alloys contain:

*Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

A sample alloy is heated at 1190°C for 1.5 hours and cooled to 1000°C at about 1°C per minute, after which it may be hot worked at 1120°C. When hot working is complete, the alloy will generally require a further heat treatment to develop full creep resisting properties.

Pohlman et al. disclose nickel base alloys suitable for elevated temperature operation containing:

*Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

The remainder of the alloys essentially comprises nickel and incidental impurities; possibly, also, small amounts of silicon and manganese.

Both references are silent regarding an  $N_v$  value requirement, although Lamb requires "a total aluminum and titanium content from about 7.75% to about 9.5%," and Pohlman et al. "prefer abot 14.5-15.5 percent by weight cobalt because that range results in the best balance at elevated temperatures between such properties as tensile and rupture strengths, oxidation resistance and the ability of the sheet material to be formed or worked."

### **The Boesch Affidavit**

Seven heats of alloys (appellants' Table I below), which were within the claimed composition ranges but whose  $N_v$  values varied from 2.40 to 2.54 (all clearly above the upper limit of 2.35 set forth in the claims), were processed and heat treated. Appellants' Table II shows that all seven heats contained sigma phase.

*Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

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*Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

The affidavit states that "any amount of sigma phase is deleterious and undesirable because of the susceptibility to embrittlement failure following exposure to high temperature."

### ***The Board***

The board agreed with the examiner that the claimed alloys were prima facie obvious from the prior art, noting that there was no substantial disagreement that both Pohlman et al. and Lamb disclose alloys having compositional limits overlapping those of the claimed alloys. Although disagreeing with the examiner's contention that there was no evidence to support the statement in the Boesch affidavit that "any amount of sigma phase is deleterious and undesirable," it agreed with the examiner that the Boesch affidavit was insufficient to overcome the prima facie case of obviousness because there was no evidence showing:

(1) the precise amounts of sigma-like phase present in compositions containing Appellants' claimed components balanced to provide  $N_v$  values just inside versus just outside Appellants' claimed "about 2.35"  $N_v$  limits; and (2) direct comparisons of sufficient mechanical properties of those compositions within and without the claimed limit, to demonstrate the alleged critical correlation of  $N_v$  limit with sigma phase content. <sup>8</sup>

The board also said that the showing (in the specification, set forth infra) did not establish the asserted criticality in selection of the components of the alloys according to the claimed  $N_v$  formula, because the alloys failed to meet the claimed compositional and  $N_v$  value requirements.

## **Opinion**

### ***The Prima Facie Case***

Each of the ranges of constituents in appellants' claimed alloys overlaps ranges disclosed by Pohlman et al. and Lamb. Appellants, citing *In re Waymouth*, 499 F.2d 1273, 182 USPQ 290 (CCPA 1974), argue that neither of the cited prior art references recognizes the problem solved by them and, therefore, cannot render the claims obvious. Upon examination of the prior art references, we do not agree. Appellants admitted in their specification that:

It has been postulated according to Pauling's theory that the criterion for the formation of sigma phase is based upon the number of electron vacancies ( $N_v$ ) in the bonding orbitals of the elements involved. Based thereon, other investigators have derived an empirical equation which includes the elements chromium, molybdenum, manganese, iron, cobalt and nickel. It is to be noted, however, that the nickel base alloys to which reference is made in the present invention relate to an iron-free or low-iron composition, with only incidental amounts of an element such as manganese, and are hardened by the aluminum and titanium rich intermetallic compound gamma prime.

U.S. patent No. 3,837,838 ('838), filed December 18, 1972, and issued September 24, 1974, was introduced into evidence by appellants and further illuminates what is meant by "Pauling's theory":

As described in an article by Linus Pauling entitled "The nature of interatomic forces in metals," published in *Physical Review*, 54:899, 1938, in a given metallic atom, the outer most orbitals, termed the bonding orbitals, are occupied by the bonding electrons responsible for bonding the atom to its neighboring metallic atoms. At a given instant in time and on the average, the bonding orbitals



are only partially occupied by the bonding electrons. Such partial occupation means that the outer orbitals are partially vacant of electrons or possess an "electron hole." The total average number of vacant orbitals in a given metallic atom is called the electron hole number of the metal ( $N_v$ ). The average electron hole number ( $N_v$ ) is the resultant of adding all  $N_v$  for the participating elements in the alloy matrix. The higher the  $N_v$  of a given Co-Cr-Ni alloy the higher the chance for the precipitation of embrittling phases. The quantities of metals consumed in precipitation do not enter in calculating  $N_v$  of the alloy matrix and hence do not participate in the formation of embrittling phases. A low  $N_v$  may thus be obtained by either choosing elements of low  $N_v$  to form an alloy or by using elements that will react in the alloy and precipitate out from the alloy matrix.

Accordingly, in carrying out this invention, I have selected an alloy-base for the system which possesses a low  $N_v$ , and have strengthened the alloy base by adding elements which will have minor or no effect on raising the  $N_v$  through controlling their percentage as solutes or by eliminating their effect on  $N_v$  by formation of compounds which precipitate out.

It appears from appellants' specification that certain precipitate-hardened nickel base alloys, after being exposed to elevated temperatures for prolonged periods of time, suffered "from a marked and catastrophic decrease in room temperature ductility and a marked increase in the rate of creep deformation." It was observed that other nickel base alloys having the same percentage ranges of components did not suffer such deleterious changes. The cause of the problem was believed to be the formation of an embrittling phase ("sigma"). As early as 1938, however, it was known that the higher the  $N_v$  value of a Co-Cr-Ni alloy, the higher the chance for precipitation of embrittling phases; also, that the quantities of metals consumed in precipitation did not enter into calculating the  $N_v$  value of an alloy matrix. We are persuaded that one of ordinary skill in the art would have been guided by these principles.

[1] In the above-quoted passage from '838, we note that lowering the  $N_v$  value of a Co-Cr-Ni alloy and deletion of the metals not consumed in precipitation from the  $N_v$  calculation are expressly suggested. Considering, also, that the composition requirements of the claims and the cited references overlap, we agree with the Solicitor that the prior art would have suggested "the kind of experimentation necessary to achieve the claimed composition, including the proportional balancing described by appellants'  $N_v$  equation." This accords with the rule that discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). Accordingly, we conclude that a prima facie case of obviousness has been established.

### **Unexpected Results**

[2] It is well settled that a prima facie case of obviousness may be rebutted "where the results of optimizing a variable, which was known to be result effective, [are] unexpectedly good." In re Antonie, supra, 559 F.2d at 620, 195 USPQ at 8-9, and cases cited therein. It is also well settled that proof of unexpected properties may be in the form of direct or indirect comparative testing of the claimed compounds (here, alloys) and the closest prior art. In re Payne, 606 F.2d 303, 316, 203 USPQ 245, 256,

(CCPA 1979), and cases cited therein.

### **A. Creep Tests**

Table V, set forth in appellants' specification and shown below, compares four examples of the claimed alloys with one example (6-3211) of a prior art alloy and is intended to show that the measured creep of the claimed alloys is unexpectedly less than that of the prior art.

*Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

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The measured creep of 6-3211 -- an alloy, appellants note, having "chemistries" within those of the references -- is in excess of three to eight times greater than the creep of the claimed alloys.

The composition and  $N_v$  values of the alloy heats in Table V are as follows:

*Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

Although it is apparent that the molybdenum content of 6-3211 exceeds the maximum content of the claimed alloys by 0.15%, it is clearly within the ranges of the Pohlman et al. and Lamb alloys.

[3] However, we are not persuaded that the Table V data are commensurate in scope with appellants' claims. In re Greenfield, 571 F.2d 1185, 1189, 197 USPQ 227, 230, (CCPA 1978). <sup>2</sup>Appellants claim broad ranges of elements, but the weight percent of elements in the four examples of the claimed alloys vary by relatively minor amounts. For example, the entire *claimed* range of carbon is .18 percent, but the *tested* range is only .02 (.07 minus .05); the claimed cobalt range is 4.8, but the test range is only 1.3. There is no evidence showing whether other alloys encompassed by appellants' broad claims and having elements varying by relatively major amounts also exhibit a low creep rate.

### **B. Ductility Test**

Appellants' Table VI, set forth in their specification, compares the room temperature ductility of one heat of the claimed alloy (2-1426) and one heat of an alloy (6-3266) which appellants state has "chemistries" within those of the references.

*Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

The marked decrease in room temperature ductility (Elong.) after prolonged elevated temperature exposure of the prior art alloy (6-3266), compared to the claimed alloy's (2-1426) essentially unchanged ductility, is contended to show an unexpected result, as was the improvement in measured creep discussed earlier. However, for the same reason that the measured creep test data of Table V are not persuasive of unexpected results, we do not regard the tensile test data of Table VI, comparing only one heat of a claimed alloy, sufficient to rebut the prima facie case of obviousness of the claimed invention.

### **C. Absence of Sigma Phase**

Throughout prosecution appellants have maintained that the claims define "a nickel base alloy which

can be manufactured in a consistent way to remain free from a tendency to form plate-like sigma phase." The "essential concept of the present invention [is] to maintain the average number of electron vacancies at a value not exceeding about 2.35." Whereas the Pauling theory teaches that a low  $N_v$  value means *reduced chances* for sigma phase, appellants allege that alloys meeting their composition and  $N_v$  value requirements are *free* from sigma phase.

[4] As related earlier, the Boesch affidavit shows that sigma phase is present in

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seven alloy examples, all of which meet the composition requirements but exceed the  $N_v$  value requirement of the claimed alloys. However, this affidavit contains no examples of claimed alloys showing the absence, or presence, of sigma. The remainder of the record reveals only a single example of the claimed alloy, which shows the absence of sigma. <sup>10</sup>Appellants' specification includes a photomicrograph of Table V alloy heat 2-1422, which clearly shows the absence of sigma; also, a photomicrograph of Table V alloy heat 6-3211, which shows the presence of sigma. We note again that the prior art teaches that reduction of the  $N_v$  value *reduces the chances* of sigma phase in the alloy. Here appellants tested only one example of a low  $N_v$  value alloy and found no sigma -- a result consistent with both the prior art teaching and appellants' allegation that their claimed alloys are "totally *free* from sigma phase." <sup>11</sup>Under such circumstances, test results involving a single alloy within the broad range claimed are not sufficient to support appellants' allegation of what would, from the prior art, be unexpected. <sup>12</sup>

In view of the foregoing we hold that appellants have failed to rebut the prima facie case of obviousness.

The decision of the board is *affirmed*.

*Affirmed.*

### Footnotes

#### Footnote 1.

Serial No. 587,776 was filed on June 17, 1975.

Footnote 2. U.S. patent No. 3,147,155, issued September 1, 1964.

Footnote 3. U.S. patent No. 3,457,066, issued July 22, 1969.

Footnote 4.  $N_v$  refers to the average electron vacancy concentration per atom in the matrix of the alloy.

Footnote 5. Appellants state that the overall variation in  $N_v$  due to chemical uncertainty is +0.25 so that in reality the  $N_v$  value of about 2.35 may actually extend from 2.32 to 2.38.

Footnote 6. Appellants' specification states that A% "refers to the atomic percent of the element so described."

Footnote 7. Creep is the permanent deformation of a metal that occurs as a result of prolonged compression or extension at or near room temperature. The Condensed Chemical Dictionary 228 (8th ed. 1971).

Footnote 8. The board agreed with the examiner that "there [was no evidence showing] that an alloy having an N vnumber of 2.35 is free of any amount of sigma phase, or what the sigma phase content and properties are of an alloy having an N vnumber of 2.36 which is close to but outside the N vrequirement."

Footnote 9. It is unnecessary to decide whether 6-3211 is the "best prior art." See *In re Malagari*, 499 F.2d 1297, 1302-03, 182 USPQ 549, 552-53 (CCPA 1974).

Footnote 10. Thus, appellants have again failed to show test data commensurate in scope with the broad claims.

Footnote 11. We agree with the board that the six United States patents ((1) No. 4,093,474, issued June 6, 1978; (2) No. 4,083,734, issued April 11, 1978; (3) No. 3,930,904, issued January 6, 1976; (4) No. 3,837,838, issued September 24, 1974; (5) No. 3,816,110, issued June 11, 1974; and (6) No. 3,767,385, issued October 23, 1973) introduced into the record by appellants "do support the assertion in the Boesch affidavit that 'any amount of sigma phase' is undesirable." Therefore, we have limited our analysis to the issue of the existence of sigma phase and have not extended it to include the effect of varying amounts of sigma phase.

Footnote 12. Where it is alleged that a certain technique for flipping coins would always produce "heads," one would hardly be persuaded by a single toss of a coin which resulted in a showing of "heads."

Footnote \* The Honorable Herbert N. Maletz of the United States Customs Court, sitting by designation.

- End of Case -

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